OCT 16 1922

Railway Age

SECOND HALF OF 1922—No. 16 NEW YORK—OCTOBER 14, 1922—CHICAGO SIXTY-SEVENTH YEAR

Published weekly by Simmons-Boardman Pub. Co., Woolworth Bldg., New York, N. Y. Subscription Price U. S., Canada and Mexico, $6.00; foreign countries (excepting daily editions), $8.00, and $10.00 a year including all dailies; single copies, 25c. Entered as second-class matter January 30, 1918, at the post office at New York, N. Y., under the act of March 3, 1879.

GENERAL LIBRARY
OCT 16 1922
UNIV. OF MICH.

PERFECT THE WORK OF THE LOCOMOTIVE WITH THE BOOSTER

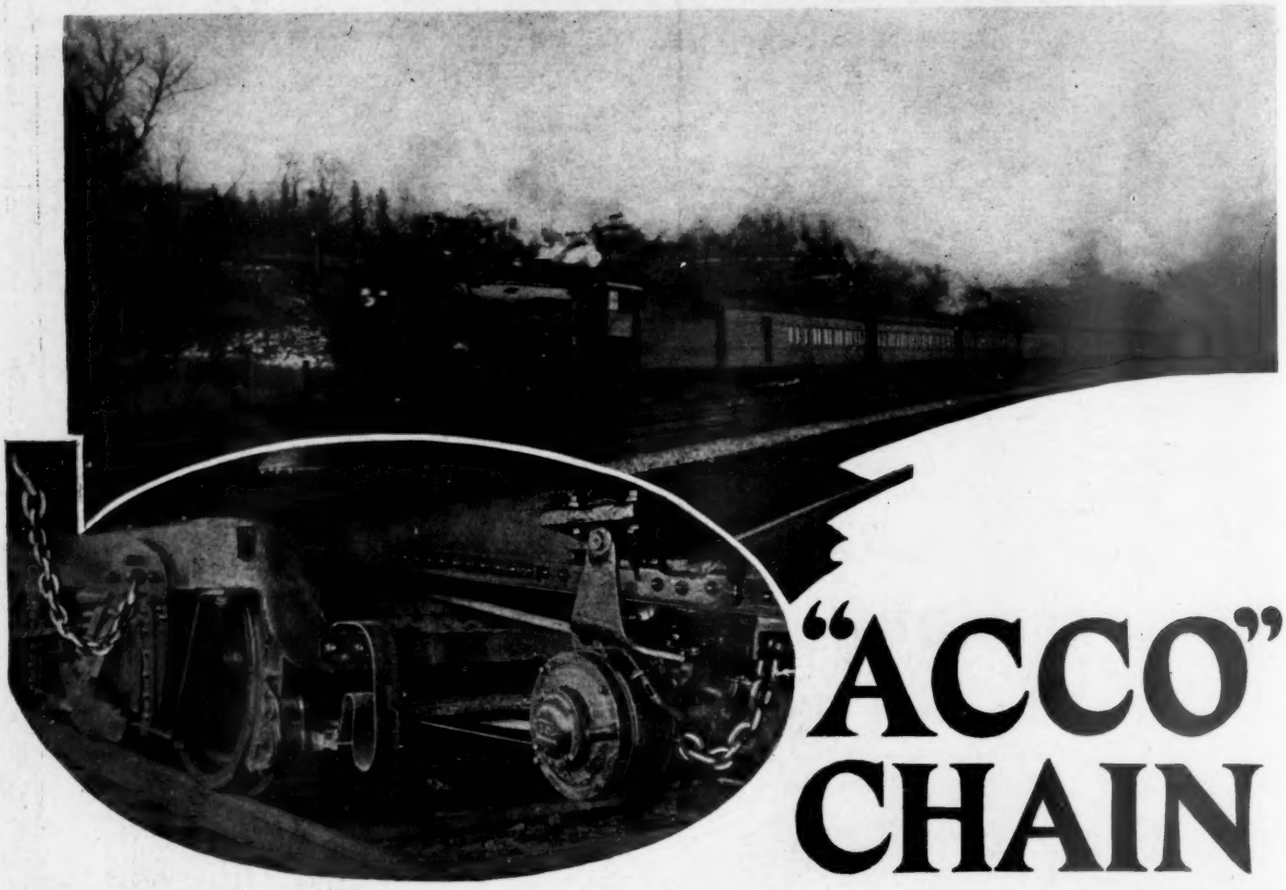
"The Booster is just the thing to enable an engine to do its work perfectly."

This is the opinion of a high operating official of a Western railroad.

By increasing the power, thus enabling the engine to do its work perfectly, The Locomotive Booster maintains schedules, reduces engine failures, makes each locomotive earn more and increases the capacity of the transportation plant.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.
NEW YORK · CHICAGO

Alphabetical Index to Advertisements, Page 120 Classified Directory of Advertisers, Page 116



"ACCO" CHAIN

FOR PASSENGER TRAIN EQUIPMENT

Extra heavy duty service, covering a period of many years, proves convincingly that "ACCO" Chain is absolutely dependable for equipment of passenger trains. Wherever "Safety" is paramount, "ACCO" chains give more than the required security. They have reserve strength in every link—and made so strong and tested so thoroughly that maximum safety is the inevitable result.

We make chains for every railway purpose, including safety chains, truck chains, axle lighting generator safety chains, brake rod chains, door chains, hose chains, conductors' valve and signal chains.

Full particulars on request.

American Chain Company

INCORPORATED

BRIDGEPORT, CONN.

DISTRICT SALES OFFICES: Boston Chicago New York Philadelphia Pittsburgh Portland, Ore. San Francisco

EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

Brighter Prospects for the C. N. R.

The outlook for the future of the Canadian National Railways has brightened with the consolidation of all the properties under one management and the appointment of Sir Henry Thornton to the chairmanship of the board of directors. Only two of the new directors have had railway experience; the rest of them represent various interests, economic and political, including that of organized labor. Presumably, then, the task of operating the properties will devolve almost entirely upon Sir Henry Thornton. Sir Henry has had experience at several widely different types of railroading in this country and abroad and he has succeeded at all of them. He has the confidence and respect of all with whom he has had dealings. His relations with labor have been particularly pleasant during his period with the Great Eastern in England. Concerning the widely different interests represented on the new board of directors, particularly that of organized labor, he has no fears. To use his own words, "A man is either straight and competent or crooked and incompetent. If he is crooked and incompetent we can easily rid ourselves of him. If, on the other hand, he is straight and competent, we have no need for fear simply because he is a labor man or the representative of any other economic interest." On another page in this issue is an article giving the details of the reorganization of the Canadian National. We feel that our readers will join with President Rea of the Pennsylvania in welcoming the appointment of Sir Henry because "he brings to his great task that full knowledge and experience of the transportation situation" which will be advantageous both to Canada and the United States.

Take Advantage of the Natural Tendencies

Analyses of railway operating statistics, unless made with extreme caution, may easily lead to erroneous conclusions. Unless all the prime factors exerting an influence on a given set of figures are taken into consideration, one may easily be led astray. As a case in point, an increase in the net tons per loaded car during succeeding months is no criterion of the amount of effort being exerted by the railroad to increase the average car loading, because the load per car increases automatically during periods of industrial expansion. The character of traffic also has an important influence. For example, variations in the amount of ore and coal movement will always be reflected in changes in the load per car. Thus, in the case of one western railroad handling considerable coal traffic, the net tons per loaded car decreased from 28.9 in March to 20.7 in April, as a consequence of the coal strike. Probably, the most vital factor influencing the car loading is the change in the attitude of the shipper which takes place during a period of improving business. Naturally, during times when the volume of his sales depends almost wholly on his success in effecting shipments, he will take full advantage of every car placed at his disposal. Therefore, even though a railroad makes no organized effort whatever to secure heavier loadings per car, an increase in the average loading is almost certain to take place. But this automatic improvement will by no means equal that which may be obtained if the management directs its efforts to this end. The greatest improvement in the car loading may perhaps be effected by showing full appreciation of the efforts made by shippers who show the greatest willingness to co-operate.

Training Railway Employees

This country is far behind Great Britain in its facilities for educating railway employees. It is true, of course, that certain roads provide courses of training for apprentices and that instruction in the operation of air brakes and other mechanical devices is given to other employees from time to time. Moreover, a number of universities offer courses in transportation subjects for regularly enrolled students, but practically no provision at all has been made for the education of men in active railroad service in such fundamental subjects as railway economics, principles of train operation and the like. As a contrast to what has *not* been done in this country, we have the statement from our British contemporary, Modern Transport, that a total of 557 railway employees attended the classes on transportation offered during the academic year 1921-1922 by the London School of Economics. Such a large attendance, of course, could not have been secured without the whole-hearted co-operation of the railways entering London. These courses were given for the most part in the evening and at other times so arranged as not to conflict with the hours of duty of the employees. In all eleven courses of lectures were offered, including such subjects as Organization of Transport, Economics of Transport, Commercial Railway Economics, Operating Railway Economics, Railway Statistics, Factors in Train Operation and Control, the Railway in Relation to the State, the Law of Carriage by Railway, etc. Such educational advantages serve the dual purpose of interesting employees in their daily activities and in providing well trained men for promotion to positions of higher responsibility. In practically every large American city there is a university or similar institution which conducts evening classes in various lines of study for the benefit of persons employed during the day. If the railways would interest themselves in the matter, these institutions would doubtless be glad of the opportunity to increase their curricula to include railway subjects.

The Smaller Mechanical Associations

The last two years have been unusually difficult ones for all of the railway mechanical associations and this has been particularly true of the smaller associations which are composed of foremen of the various departments, such as the general foremen; master blacksmiths; master boilermakers; tool foremen; chief interchange and car foremen; master tinners, coppersmiths and pipefitters; air brake men; and traveling engineers. The need for strict economy has either made necessary the abondonment of conventions, or has materially restricted the attendance. Several of these associations, which regularly meet in the fall, have been forced recently to cancel convention plans or to postpone them until later in the year because of the shopmen's strike, which made it impossible for

foremen who had to do with the maintenance of equipment to leave their posts for even a few days. These associations have accomplished much in the past and are responsible for the introduction of many improved practices and methods of doing work which have saved the railroads many times over the small expense involved in maintaining the associations and in holding their annual conventions. Printed committee reports are valuable and helpful to a member who is obliged to stay at home, but the only way in which he can obtain the greatest help is by talking over his problems with others who are working in the same field. Much of the benefit of a convention which is taken home, never gets into the printed proceedings, but is developed through informal conversation. The present time is a critical one for some, if not all, of these associations. The demands upon the supervisory mechanical officers are bound to be heavy in the next few years and many new men will be needed. Everyone will require all the assistance and helpful inspiration that can be obtained from the work of the various associations. There never was a time when such work was of greater importance or more lasting good could be accomplished. It is to be hoped that such associations will receive the needed and whole-hearted support of the higher executives of the railways.

Water Supply and Traffic Movement

In the every day work of a railroad, occasions seldom arise where it becomes necessary to the functioning of their departments that officers charged respectively, with the responsibility of supplying water and with the moving of cars should "lose any sleep" over each other's trials and tribulations. So well established is the understanding that to supply water is one thing and to handle tonnage another that it is rare for either branch to manifest more than a casual interest in the affairs of the other. In keeping with this, those entrusted with the water supply ordinarily concern themselves little with what transpires on the locomotive side of the water tank other than to prevent a reckless waste of water where it is none too plentiful. But the situation, for a time, is now changed. The business of moving traffic is the immediate concern of all; a circumstance which means several things in water service. In general, it means, first, that present practices in water service must for the time be justified unequivocally by their contribution to the moving of business or be suspended until the emergency is passed. Specifically, it means that the department, above all else, should so study the trend of consumption and adapt its equipment to the consumption as effectively to guard against shortage. This may lead to a new pumping schedule, or to the repairing of a pump which might otherwise be left untouched until a breakdown occurs. Or, as in the case of one railroad, it may lead to the temporary installation of emergency pumping units. Next to preventing shortage, it means that efforts shall be directed to the elimination of all causes of delay to trains, however slight, that may result in one way or another from a shortcoming in water service. An investigation to this end may disclose the advisability of again cleaning all roadside tanks as well as the more frequent sludging of settling tanks to protect locomotives from delays resulting from roily water. Again, it may disclose the advisability of making a radical alteration in the prevailing method of treating the water in order to eliminate road troubles, even if at the expense of a little more shop work. It may warrant slight changes around the standpipes that will enable engines to take water more quickly, or even such a modification in the method of receiving chemicals or other supplies as will release cars more quickly for revenue service.

Employee Representation on the Pennsylvania

The shopmen's strike and the way in which the Pennsylvania Railroad came through it has served to focus attention on the scheme of employee representation which has been developed on that system during the past year and a half. Less than 30 per cent of the Pennsylvania shopmen left the service when the strike was called, and two months after the strike started the shop force had been restored to more than 95 per cent of the normal working force. The first comprehensive and authoritative account of the development of the employee representation plan and its workings has just been given out—an article in this issue covers it fully. The plan marks a distinct step forward in drawing the men and the management closer together and making a larger degree of real team work possible—a thing which is quite necessary if American railroads are to serve the public acceptably. Briefly the plan provides for the employees having a voice in matters affecting their welfare. The machinery which has been set up makes possible a prompt consideration of all grievances, criticisms and suggestions; these are freely and openly discussed around the table by representatives of the men and the management. The plan itself seems to be mechanically correct. The real factor, however, is the spirit which must vitalize it—a spirit of co-operation and fairness. That this is not lacking is indicated by the results that have been obtained thus far. It is important to understand, in installing and developing a scheme of this sort, that it must be dominated by the right sort of spirit and this must extend from the very top—the board of directors—all the way down to the least important foreman. Even one man in the chain who may be out of harmony will do much to endanger its success. The operation of the plan should incidentally locate inefficient foremen or officers, at least from the standpoint of understanding men and controlling them, and thus make it possible to develop them by proper coaching and training, or to eliminate them if they fail to improve. Handling grievances promptly at the point where they develop prevents their spreading and becoming aggravated; it adds dignity to the local supervision and makes for closer and more cordial relation between the men and the local officers.

Do Railroads Suffer From Inbreeding?

"NINETY PER CENT of the success of a railroad depends upon the human element." This is one man's estimate of the value of personnel in railroading. The same idea has often been expressed by others and is, beyond question, the dominant thought underlying all management. Transportation means movement, consequently dynamic energy is the important quality in those who direct it. But it is not alone in the transportation department that the human element is a vital factor. The effectiveness of the various special branches of the railway organization is even more dependent on good leadership. If a division superintendent, a general superintendent, or a master mechanic, proves unworthy, the results of his shortcomings become apparent to his superiors almost immediately and he is quickly brought to account or dismissed. But there is no such check on the bridge engineer, the engineer of tests, the signal engineer, the superintendent of timber preservation, the general safety agent, the superintendent of water treatment and the director of fuel conservation. So long as the work assigned to them moves smoothly and they keep out of trouble they are comparatively safe in their positions. The real success of the special department, as measured by the extent to which it becomes a vital factor in the efficient operation of the property, depends on the extent to which the man in charge is able to convince the management of the merits of the various measures which he wishes to initiate.

The success of a specialist not only implies a profound knowledge of his subject, but demands also personality and force that can drive home the ideas which his special knowledge gives him. Obviously, this calls for the exceptional individual. The man must be willing to devote his time to the minute technology of his own specialty and this as a rule unfits him for promotion to other branches of the service. The direct result is that his tenure of service in a given position is usually much longer than in the case of the operating officer, who, if he is successful, is frequently transferred from one point to another and rapidly advanced to positions of greater responsibility.

Because of the limited opportunities for promotion and because of the predominating characteristic of the department head, it is usually found that these special departments are of the one-man type. His individuality dominates the work. He alone is held responsible for the results. The situation is one not specially conducive to the development of competent assistants or understudies.

While the one-man organization places a subordinate in an unfortunate position and tends to drive out the more ambitious members of the staff, it does no particular harm to the property as a whole, so long as the head of the department retains his position. The difficulty arises when he resigns or dies. Usually no strong man is available to take his place, but notwithstanding this fact someone from his organization, or, someone from another department of the road, is selected to take his place. The result in either case is much the same. The new incumbent must be educated either in the technology of his position or in the art of management and several years will elapse before the department can recover from the period of ineffective leadership.

Much better results would be obtained if the railroads pursued the policy of canvassing the entire special field for a fitting successor, something which could be done through the channels of the various national associations. A man secured in this way would often be more familiar with the work of his predecessor than anyone actually having previous service on the railroad, but the greatest gain would accrue from the healthy turn-over in the field as a whole. Promotions would be more frequent and the special knowledge would be more thoroughly disseminated among the various roads. It would overcome the effects of the inbreeding from which the special departments on some of the roads of the country are suffering.

Settlements with Train Service Employees

MANY OF THE RAILWAYS recently have made agreements with the conductors' and trainmen's organizations under which the present wages and working conditions of these employees will be maintained for a year. Some railways have made similar agreements with the engineers' and firemen's organizations. These developments mean that existing controversies between the railways and organizations signing the agreements will be withdrawn from the Railroad Labor Board for the period mentioned. Indications are that in a comparatively short time practically all the railways will make similar settlements with the engine and train service employees.

The reasons why these settlements are being made are fairly obvious to those familiar with the pertinent facts. The engineers and conductors are the highest paid railway employees. The firemen and trainmen are among the highest paid. When the railways about a year ago applied the second time within a year to the Railroad Labor Board for general reductions in wages, they asked that the wages of train service employees should be reduced ten per cent, and that time and one-half for overtime in freight service should be abolished.

It was evident even then, however, that serious difficulties would be encountered in trying to secure reductions of the wages of these employees. The RAILWAY AGE mentioned these at that time. The work done by employees in train service is different from that done by any class of workers in any other industry, and therefore it was impracticable to base petitions for reductions in their wages upon the ground that they were being paid more than men doing similar work in other industries. Furthermore, measured by the increase in the cost of living since before the war, the pay of engineers and conductors generally did not show increases in purchasing power. Measured by the same standard, the wages of firemen and trainmen had increased, but not anywhere near as much as those of most other classes of employees. Since then there have been no substantial changes in the cost of living. It was, therefore, plain that the railways would find it difficult to make a case before the Labor Board under the provisions of the Transportation Act for reductions of the basic wages of train service employees.

The situation was different with respect to time and one-half for overtime in freight service. It is based upon an unsound principle and by giving employees a positive incentive to delay the movement of trains it tends to interfere with efficiency of operation. We have not heard the last of it yet. But the railways have just gone through a strike of shop employees which has more or less crippled many of them. They are confronted with a demand for the movement of the largest traffic in history. For them to have got into a serious controversy with the train service employees under present conditions would have been most undesirable from their standpoint, and especially from the standpoint of the public.

There was another reason why the railways were disposed to deal even generously with employees in train service. With a few exceptions they have stayed at work and faithfully performed their duties during the shop employees' strike when such performance of their duties was almost vital to the interests of the railways and the welfare of the country. This undoubtedly influenced many railway managers to be disposed to postpone any attack upon their wages. If a serious effort was not to be made in the near future to secure reductions of their wages it was expedient to take action that would show this was the case. The railways under present conditions need the most efficient service that the train service employees can render, and they would have found it impossible to get such service from them if the employees had been in constant fear that proceedings speedily would be pushed for reductions in their pay.

The railway industry needs a truce to labor controversies in present circumstances above almost everything else. The shop employees' strike is now on most railways a matter of history, although the effects of it are still felt and long will be felt. Peace between the railways and the train service employees now seems certain for at least a year. No other class of employees can by strikes or other means seriously interfere with the movement of traffic. So far as the labor situation is concerned, it would seem that the railways are now going to be given an opportunity to operate their properties for a time with maximum efficiency.

While the wages of train service employees were reduced by a small percentage in 1921, the agreements made leave them among very highest paid of any class of working men in American industry. The average monthly earnings of railways general officers, including all the so-called "fancy" salaries, are $532, and of division officers, $320, the average for all general and division officers being $418. The

average monthly earnings of passenger engineers in July were $254, or an annual rate of $3,048, and the average earnings of passenger conductors were $233, or at an annual rate of $2,796. The average earnings of engineers in freight service were $237, and of conductors in similar service, $212. The average earnings of passenger firemen and helpers were $187, and of passenger brakemen and flagman, $155, the average earnings of firemen in freight service were $165, and of freight brakemen, $154. The highest wage of all, that of freight engineers in local and way freight service—$275 a month, or at an annual rate of $3,300—is not much below the average earnings of division officers, and is more than half as large as the average earnings of general officers. The lowest, that of brakemen, exceeds $1,800.

Certainly none of these classes of employees can justly complain about their compensation in comparison with that received by their officers, or that received by men in any other industry. Once having agreed to continue to pay them these relatively high wages, the railways will have the right to ask in return the most loyal and efficient service that they are capable of rendering.

Keep the Individual Car Moving

WITH A SHORTAGE of more than 100,000 cars at the last report (September 23) it is evident that the limited car supply is now an important factor in the ability of the railways to meet the transportation demands of the country. Every effort that is made, therefore, to use more intensively the cars that are available tends to increase their capacity. Heavier loading of cars is one alternative with vast possibilities; the reduction of delays to cars is another. Both now require increased supervision, particularly the latter.

To keep *all* cars moving, attention must be given to *each* car. The big problem now is to bring to light the individual car, loaded or empty, which is being delayed, for when discovered the remedy is obvious in most cases. Nothing will contribute more to this than the personal checking of "on hand" reports by local operating officers at short intervals. The detection by each operating officer of at least one car every day that would otherwise have remained idle will do much to stimulate activity in this direction.

The problem of keeping cars moving has many ramifications. It involves the constant checking of yards to detect cars delayed by "no bill" or other causes, the supervision of company material shipments, the regular inspection of outlying sidings and spur tracks, the prompt and frequent switching of repair tracks, etc. It also involves enlisting the co-operation of shippers in releasing cars as quickly as possible, even when this involves overtime and extra expense for them. At a time such as the present when the co-operation of each shipper will contribute to the common good of all by increasing the number of cars available for their traffic, it is possible to induce many of them to employ extra forces or to work forces longer hours to load and to unload cars more quickly. Many car days can also be saved by the co-operation of the shipper in keeping the railway advised regarding the unloading of cars so that it can move them promptly when released and also in unloading them quickly when placed.

The greatest improvement in the use of cars will not be secured by new or novel means, but by the universal application of those measures with which every railway operating officer and shipper is familiar, but the importance of which they may fail to realize as an aid in the present period of heavy traffic. If those measures are adopted which will keep each individual car moving, as far as practical, the question of car mileage will be answered and a long step will be taken toward meeting the present unusually heavy transportation demands.

Getting the Most Out of Locomotives

NEVER IN HISTORY did conditions so imperatively demand that the railways should get the most possible service out of their locomotives as they do now. The RAILWAY AGE showed in an editorial published two weeks ago how greatly the increase in the number of locomotives in service has declined within the last twenty years.

It is sometimes said by persons who do not study the facts that this decline of the increase in the number of locomotives in service has been largely or wholly offset by the increase in their average tractive power. Unfortunately, this is far from true. The Interstate Commerce Commission has published statistics regarding the tractive power of locomotives since 1902. In the five years ending with 1907 the average increase per year in the total tractive power of locomotives in service was 128,000,000 pounds. In the seven years ending with 1914 the average increase per year was less than 75,000,000 pounds. In the seven years ending with 1921 it was only 63,500,000 pounds. In the year 1921 it was less than 39,000,000 pounds.

Indications are that the increase in the demands of traffic will be as great in the present period of business revival as it has been in past periods of business revival. These figures demonstrate that the total increase in the tractive power of the locomotives in service has been nowhere near in proportion to the probable increase in the demands of traffic. It is probable that the amount of traffic handled cannot possibly be increased as much as it has been in past periods of active business.

The effects of the great decline in the amount of new locomotive power provided can be largely offset only by greatly increasing the number of tons carried one mile per locomotive and per pound of tractive power. The first thing needed to increase the amount of traffic handled with each unit of power is to secure the maximum practicable loading per freight car. Every unnecessary ton of the dead weight of cars which is pulled is a waste of power. The second most essential thing to do in order to secure the maximum utilization of available power is to increase the number of cars per train as much as is consistent with getting the trains over the road in reasonable time. Every time an engine is pulling less cars than it can reasonably pull there is a waste of power.

But the maximum utilization of power cannot be obtained unless every possible expedient is adopted to secure not only the heaviest practicable train loads, but to get the trains over the road with the least possible delay, and to keep locomotives out of shops and out on the line pulling trains as much of the time as practicable. The places where the worst congestions develop and delays occur on railroads are in yards and terminals and in roundhouses and shops. Usually the main tracks are not congested. Therefore, the more trains there are which are so made up and operated as to move long distances without breaking up and making up in intermediate yards, the greater will be the service obtained from power.

Likewise, the longer distances locomotives are run without being taken off trains and turned the greater will be the service obtained from the power. Of course, however, if locomotives are to be run longer distances without attention they must be sent out in the best practicable condition. Furthermore, if trains are to be moved with the maximum average speed practicable in proportion to the size of train loads, they must be despatched in such a manner as to permit the fewest and the shortest possible delays to them. Despatchers can do much to increase the service obtained from locomotives by using their utmost resources to prevent trains from accumulating at points where congestions of trains tend to develop, such as at coaling stations.

All such suggestions as the foregoing point to one sugges-

tion which, under such conditions as now exist, is of the most vital importance. That is, that the most intensive supervision should be exercised by yardmasters, roundhouse foremen, despatchers, trainmasters, road foremen of engines and other supervisory officers over the handling of locomotives and trains. The vital problem which must be solved if the railways are to move the maximum possible traffic with existing facilities is that of keeping not merely every car moving, but also every locomotive moving as much as possible with the maximum practicable load. Statistics upon the subject show not only that there has been a decline over a period of years of the increase in the total tractive power available, but that there has not been, even in times of heavy traffic, an increase in the number of ton-miles per locomotive proportionate to the increase in the average tractive power of locomotives. In other words, even the relatively small increase in tractive power has not been fully utilized. Further analysis of the statistics has shown that this has been due to the fact that the number of miles run per locomotive per month or per day has not been increased or even maintained.

The railways should be making every effort to increase the number of ton-miles per day of cars, but they should be making even greater efforts to increase the number of ton-miles per locomotive per day. Unless the statistics upon the subject are very misleading, there is a great opportunity to increase the amount of business handled with existing facilities by more intensive supervision to increase the mileage of service obtained from locomotives.

Organized Labor's Sense of Responsibility

THE REPORTS of the annual meeting of the National Union of Railwaymen, Great Britain, as published in the union's official magazine, would make surprising reading for anyone who knows labor unionism only from observing conditions in America. Most of the time of the convention, as could be expected, was taken up in the discussion of matters of union policy directly affecting the economic status of its members, but the duty of unionized employees to their employers and the public was not neglected. Witness the opinion of J. H. Thomas, parliamentary general secretary of the union, on the subject of railway employees who are found guilty of pilfering:

> They will get no sympathy or support from our organization in this matter, and I warn them that we will be as anxious as the railway companies to stop this kind of thing. We shall show no mercy to them. The union has respect throughout the length and breadth of the land, and has established the confidence of the railway management, which finds its reflex in many ways. We believe we can contribute to the efficiency of railway service, and we can do much to help the undertaking. We must let the traveling public know and feel in sending goods on the railway they are entrusting them to men who are jealous and proud to maintain their trust.

Local committees of employees and officers are the foundations upon which rest the peaceful adjudication of disputes on Great Britain's railways. Above the local committees are the district councils, above them the railway councils and above the railway councils the two national bodies, the Central Wages Board and the National Wages Board. This method of organization is important because it does away with the professional grievance man and distributes his functions over a larger number of men. The larger the number of employees who come together with their local officers, the larger the group which is going to be informed of the viewpoint of the officers; also, conversely, the officers will get the point of view of larger numbers of employees.

Because of the closer contact between officers and men, there is a considerable improvement in the interest of the union in the successful operation of the railways. C. T. Cramp, industrial general secretary of the union, at the annual convention outlined, as some of the accomplishments which the local committees should strive for, the prevention of claims for loss and damage, heavier and better car loading and improved efficiency generally. Mr. Cramp said further that, while he believed capitalism to be an evil thing, nevertheless that there were among those in high positions within the capitalist class men who were as fair and as honorable as anyone in his own class.

These favorable conditions obtain in Great Britain in spite of the fact that organized railway employees are committed to a policy of government ownership and operation with union participation the same as in America. The British unionists are evidently proceeding on the hypothesis that if the railroads are to be turned over to the government with union participation in management it will be better if they are turned over as going concerns rather than as bankrupts. They also appear to be working with the idea that if they are ever going to be allowed to participate in management under a policy of nationalization that it is up to them to prove themselves capable of performing such a trust.

If there is any lesson to be learned from the railway labor situation in Great Britain—and there should be many—it is that organized labor will find it to its advantage to develop a sense of responsibility in the performance of its duty to its employers and the public. As a corollary to this it might be added that employers should foster and encourage the development of this sense of responsibility by every means in their power—the outspoken recognition of the disciplinary action taken by the trainmen against leaders of certain outlaw strikers, for instance. Another method is the appointment of union leaders on technical commissions and calling for their advice and assistance in outlining the broader phases of railway policy. J. H. Thomas of the National Union of Railwaymen was one of the members of the commission which prepared the able report on automatic train control, a resumé of which was published in the *Railway Age* of July 22, page 149.

It is a question, of course, whether union leaders in this country would co-operate in any such arrangement or whether they would permit their members to meet with the managements in committees formed not only to adjudicate disputes but to promote efficiency of operation. That, however, is for the unions themselves to decide. They, more than anyone else, stand to benefit from the development of a sense of responsibility to their employers and the public. The railways and the public should, however, foster this development as much as they can—especially on the part of unions which by their age and the high ratio of their members to total eligible employees have given proof of their strength and permanence.

New Books

Railroads and Business Prosperity, a Series of Addresses and Papers Presented at the Annual Meeting of the Academy of Political Science in the City of New York, April 28, 1922. Edited by T. W. Van Metre and Parker Thomas Moon. 130 pages. 6 in. by 8½ in. Bound in Paper or Cloth. Published by the Academy of Political Science, Columbia University, New York. Price $1.50 Bound in Paper.

This book contains thirteen addresses on the subject of railway transportation which were delivered before the meeting of the Academy of Political Science on April 28. The speakers were well chosen and this report of their addresses gives in compact, readable form the best survey obtainable of expert opinion on current problems in railway economics.

As such it merits the attention of every railroad man who is concerned with the questions of railroad policy. No railway publicity man should be without it, as indeed should no one who is in any way interested in solving the problems confronting the railroads today.

The addresses reproduced in this book were on three general subjects, viz: the Labor Provisions of the Transportation Act; Railway Policies and the General Welfare; and Freight Rates and Business Revival. Some of the speakers were: Professor Henry R. Seager of Columbia University; Professor Frank H. Dixon of Princeton University; C. B. Heiserman, general counsel of the Pennsylvania; W. N. Doak, vice-president of the Brotherhood of Railroad Trainmen; Henry T. Hunt, formerly of the Labor Board; Henry C. Wallace, Secretary of Agriculture; Daniel Willard, president of the Baltimore & Ohio; Walker D. Hines, formerly director general of railroads; Professor W. J. Cunningham of Harvard University and R. H. Aishton, president of the American Railway Association.

The Academy of Political Science has shown its appreciation of the importance of the railroad problem by having scheduled it for discussion at two of its meetings during the past few years. The value of open forums such as these in bringing railroad problems to the attention of the intelligent public needs no extended elucidation. Railroad men can show their appreciation of the Academy's work in no better way than by following these meetings, if not in person, at least by a study of the proceedings.

The Eastern Railroad. By F. B. C. Bradlee. 118 *pages, 6 in. by 9¼ in. Cloth. Published by The Essex Institute, Salem, Mass.*

This is a book of a single chapter—of 118 pages; a "Historical account of early railroading in Eastern New England, second edition." The lack of chapter headings and of an index will detract from its usefulness, and the reader unacquainted with eastern Massachusetts and southern Maine needs a map if he is to read intelligently; but the book is very interesting in spite of these deficiencies.

The work is about the same as a journal, the only classification of material being chronological, but the author has selected his matter with excellent judgment, and there are no dull pages. He has given us, evidently, a faithful abstract of the railroad news (of that region) to be found in the files of the newspapers of Salem and Boston for the 60 years covered by his story. Yet it is not a mere abstract, as the author must have had a considerable personal acquaintance with the men and things with which he deals. He is a lover of accuracy.

The substance of the book is essentially "popular." The business and financial affairs of the railroad are not neglected, but the personalities of the officers, conductors and station agents, the time-tables, the pictures of locomotives and old station buildings and other features with "local color" constitute the most salient features. The consolidation of the Eastern and the Boston & Maine in 1884 is well covered.

New England was a field of anti-slavery discussion as far back as 1841 and it appears that the term "Jim Crow car" was in use at that time. Controversies about negro passengers led the Eastern Railroad to abolish second-class passenger cars, in which the fare had been about a third less than the first-class rates. The difference of view as to the use of the words "depot" and "station" seems also to have arisen back in those early days. "Depot" is used in officers' orders and quite generally, yet the pictures of early buildings show them lettered with the word "station." George Peabody, afterward eminent as a philanthropist, was president of the Eastern from 1836 to 1842.

The Eastern began using coal in its locomotives in 1858, but it neglected the use of the telegraph (except possibly in very unusual circumstances) until 1871, after the Revere collision, which killed 29 passengers. In 1872 Charles F. Hatch was brought from the Lake Shore & Michigan Southern and made general manager, and Hall automatic block signals (wire-circuit) were installed on 16 miles of the road. Although the Eastern was the main railroad from Boston to Maine and New Brunswick it had at that date only 20 miles of double track.

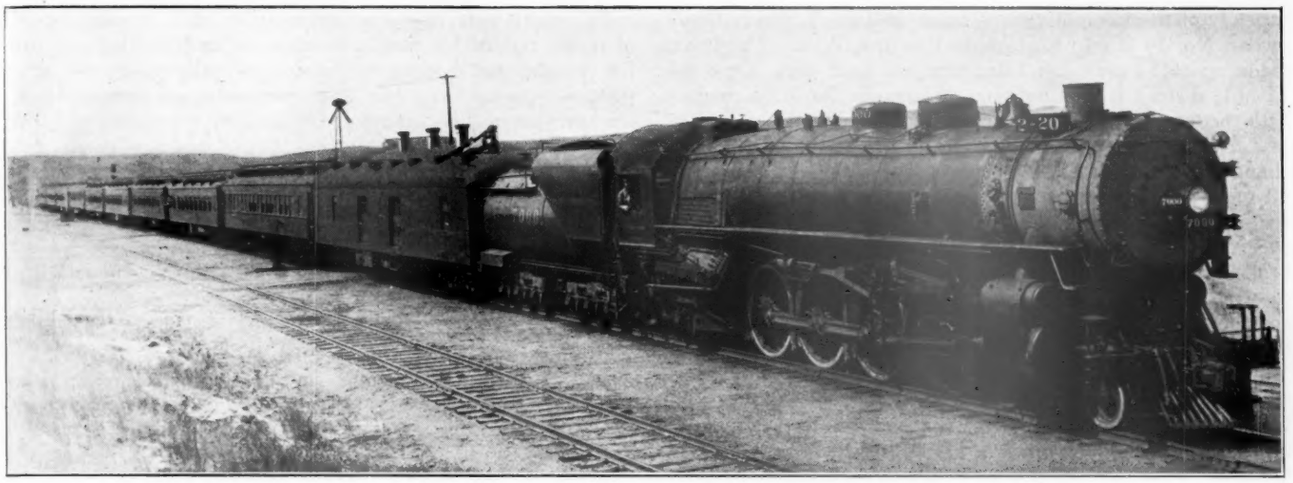
Proceedings of the American Wood Preservers' Association, 1922. *534 pages of text, 6 in. by 9 in. Illustrated. Bound in cloth or paper. Published by the American Wood Preservers' Association, S. D. Cooper, secretary, c/o Atchison, Topeka & Santa Fe, Topeka, Kan. Price, cloth* $6, *paper* $5.

As indicated by the title this is a report of the eighteenth annual convention of an association organized in 1905 for the development and improvement of the science of timber preservation, and the conservation of forests through the increased use of treated timber. One of the most valuable features of the volume is an annual report of statistical data on the use and consumption of treated timber, the volume of preservatives used, and other related data prepared by the United States Forest Service in co-operation with the American Wood Preservers' Association. The list of members in the back of the book, amplified by a classification of the membership according to railroads, industries, educational institutions, etc., also comprises a valuable "Who's Who" in the timber preserving industry. From the standpoint of the railway reader the volume this year is of greatest value because of the amount of space devoted to the economics of timber preservation as applied to railway crossties. Committee reports and individual papers presented and discussed at the convention in Chicago on January 24, 25 and 26, as reported in the proceedings include such topics as the Economics of Crosstie Renewal; Factors Affecting the Cost of Treated Crossties; the Feasibility of Introducing Tropical Ties in the United States; the Experience with Treated Wood on the Santa Fe; Should the Cost of Treating Ties Be Charged to Maintenance or Capital Account?, etc. Mention should also be made of the voluminous progress report made by the San Francisco Bay Marine Piling committee, which has developed valuable information concerning the marine borer problem. Other papers presented relate to the more technical problems of timber preservation and to efforts being made to promote the wider use of treated timber in the United States.

Universal Directory of Railway Officials, 1922. 5½ in. by 8½ in. 644 Pages. Bound in Cloth. Compiled by the Editor of the Railway Engineer (London) and Published by the Directory Publishing Company, Ltd., 33, Tothill Street, Westminster, London, S. W. 1, England.

This is the twenty-eighth annual edition of this work, which gives the names and addresses of principal officers of all the railways of the world. As such it is a valuable reference book for manufacturers of railway equipment and supplies and others who wish to keep in touch with railway officers in various parts of the world. Classification is by countries and under each country the names of the railways with a list of their officers are given in alphabetical order, together with a few details about each railway such as length of line, gage and number of locomotives and cars. Names of foreign railways are given in the language of the country together with their English equivalent. Reference is further facilitated by an alphabetical index of all railway officers. The book is as up-to-date as is possible under the circumstances.

THE "PULLMAN NEWS," October issue, contains an announcement of the establishment of free industrial insurance by the Pullman Company in connection with its system of employee representation.



Locomotive 7000 Hauls 11 Steel Cars Over a Heavy Grade Division

Service Records of U.P. Mountain Type Locomotives

Performance Indicates that No. 7000 Exceeds Both Theoretical Starting and Horsepower Capacity

THE LIGHTEST Mountain type locomotive in proportion to maximum horsepower capacity which has yet been built, was delivered to the Union Pacific by the American Locomotive Company late in May, 1922. From the date of breaking in during the last week in May to July 3, this locomotive made 10,000 miles, at the rate of 300 miles a day, and up to the end of August had made a total of 28,000 miles. Much of the service during this time has been made on runs of approximately 500 miles in length, some of which have been made without cleaning either the fire or the ash pan.

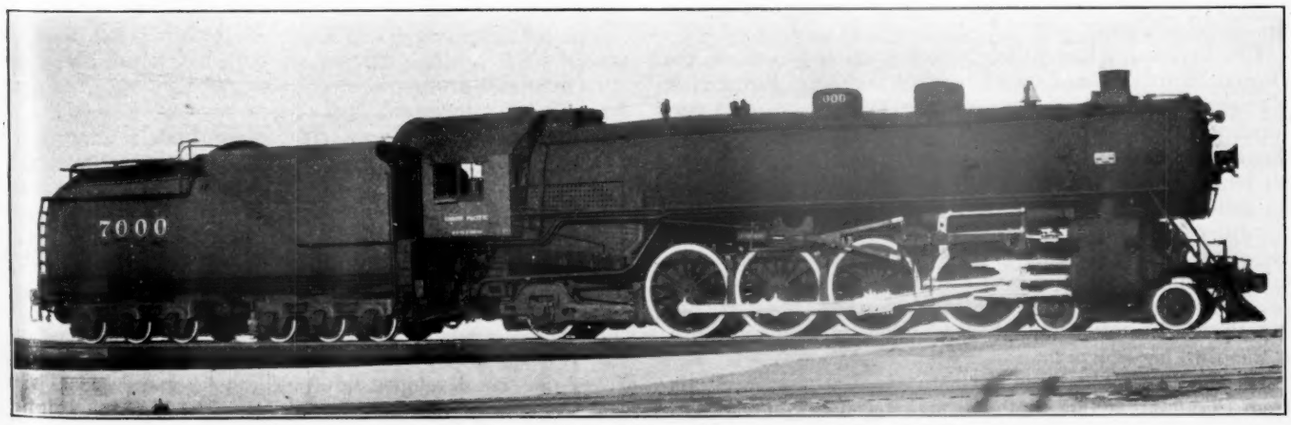
This locomotive, a description of which has already appeared in these columns,* has a total weight of 345,000 lb., of which 230,000 lb. is on the drivers, and a rated tractive effort of 54,800 lb. It has 73-in. driving wheels, 29-in. by 28-in. cylinders and a boiler pressure of 200 lb. per sq. in.

Engine No. 7000 and the 54 additional locomotives of the same type which have since been ordered, were built for use in passenger service between Cheyenne, Wyo., and Ogden, Utah, a distance of 484 miles in which are encountered numerous long grades. The character of the line, which is shown in the accompanying profile, is such that passenger trains have been handled by Mikado type locomotives. With these engines it has been necessary to maintain high running speeds on the down grades in order to maintain the passenger train schedules with the comparatively low speeds which can be made on the up grades. The high sustained capacity of the Mountain type locomotive was expected to maintain the schedules with less extreme variations from the average speed.

Locomotive 7000 made its first trip in passenger service on June 1. Following a trip from North Platte, Nebr., to Omaha, a distance of 281 miles, with a train of refrigerator cars weighing 2,460 tons, which took seven hours and fifty minutes, earlier in the day, the engine left Omaha at 4:30 P. M. with train No. 3 which it took through to Cheyenne, Wyo., a distance of 507 miles, arriving at 10:30 A. M. on June 2. On the same afternoon the locomotive left Cheyenne for Ogden, Utah, a run of 484 miles, with a train of 10 sleepers and two diners, a run requiring 15 hrs. 15 min. of continuous service from the locomotive, which was made with no trouble whatever from journals or bearings running hot.

One of the best runs indicative of the high sustained

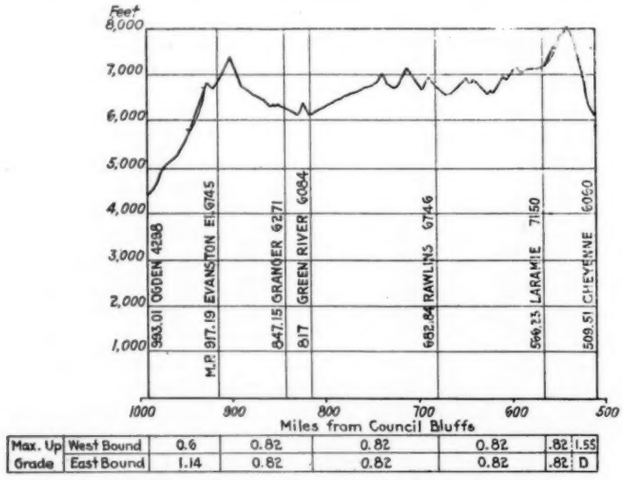
* See the June 10 issue of the *Railway Age*, page 1325.



This Locomotive Established New Records by Developing 3,500 Indicated Horsepower

capacity of the locomotive was made on June 9, when it took second No. 19 from Cheyenne to Rawlins, Wyo. The train, made up of 11 cars, left Cheyenne one hour late. Over the 57-mile district from Cheyenne to Laramie the train made a little better than running time. For the first 31 miles out of Cheyenne is encountered a steady up grade with a total change of elevation of slightly less than 2,000 ft. and about 10 miles of 1.55 per cent ruling grade. The schedule calls for an average speed of 28.4 miles an hour with no stops over this district. From Laramie to Rawlins the grade is broken, with the difference in elevation slightly favorable to westbound movement. Several grades, however, one of considerable length, are encountered. Over this district, 116 miles in length, the running time is three hours and twenty minutes, including four stops. Engine 7000 made this run in two hours and twenty-six minutes. Deducting the time for the stops, this required an average running speed of 60 miles an hour. The highest speed attained was 75 miles an hour, at which the locomotive operated with remarkable smoothness.

On June 15, Engine 7000 took eastbound train second No. 20, consisting of 13 cars, from Ogden to Cheyenne. This train left Ogden 40 min. late, 25 min. of which was made up on the long heavy climb between Ogden and Evanston,



Profile of Union Pacific Between Ogden and Cheyenne

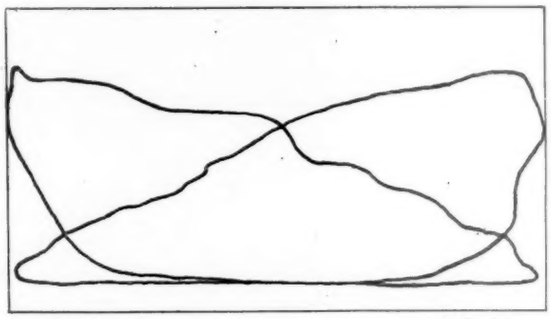
Wyo. In the first 65 miles of this 76-mile district there is a change of elevation against eastbound movement of 2,500 ft. with a 16-mile ruling grade of 1.14 per cent. The schedule of No. 20 calls for an average speed of 27.6 miles an hour with no stops. On this run engine No. 7000 maintained an average of 32.7 miles an hour over the district.

This 484-mile run was made without cleaning either the fire or the ash pan.

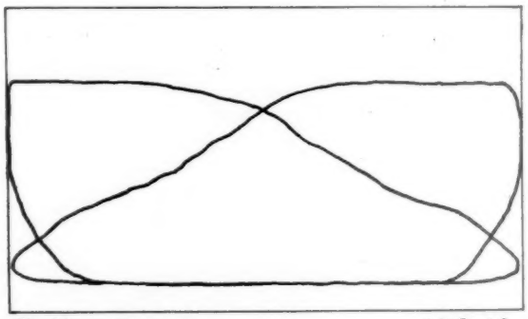
The locomotive has made a number of runs both on the Oregon Short line and the Oregon, Washington Railroad & Navigation Company. On a number of these runs its performance over 2.2 per cent grades has been observed. Although the locomotive is not primarily designed for service on long mountain grades of this character, but rather for its ability to maintain comparatively high speeds on grades requiring considerably less than the maximum starting tractive effort, it is interesting to note that the locomotive maintained 28-miles an hour with a train of 12 cars over a 2.2 per cent grade, and with 10 cars was able to start and rapidly accelerate to a speed of 10 miles an hour, at which it was working at less than half cutoff.

On another occasion this locomotive took a passenger train from Pocatello, Idaho, to Portland, Ore., a distance of 729 miles, including four engine divisions, without cleaning the fire.

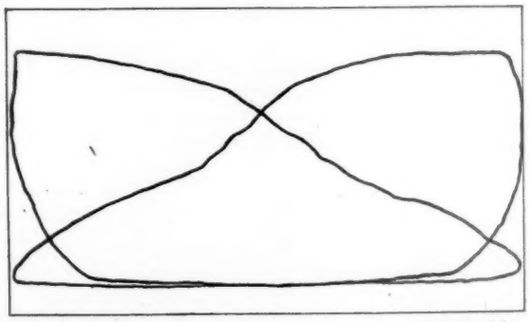
In recent tests this locomotive established a new record of power output for simple locomotives and also set a figure for weight per horsepower which is believed to be substantially lower than has ever been attained previously in road service in this country. On October 1 locomotive 7,000



Boiler Pressure ..... 198 Lb.
Mean Effective Pressure ..... 81.42 Lb.
Miles Per Hour 50
Indicated Horsepower 3500



Boiler Pressure ..... 198 Lb.
Mean Effective Pressure ..... 91.57 Lb.
Miles Per Hour 44
Indicated Horsepower 3464



Boiler Pressure ..... 200 Lb.
Mean Effective Pressure ..... 99 Lb.
Miles Per Hour 40
Indicated Horsepower 3404

Typical Indicator Cards Taken on Road Tests

hauling train No. 4, consisting of 11 cars weighing 810 tons, at a speed of 50 miles an hour on an ascending grade of 0.82 per cent developed 3,500 indicated horsepower. This is at the rate of one horsepower for each 98.6 lb. weight of the locomotive; moreover the power developed is 15.5 per cent greater than the rated cylinder horsepower and 17.2 per

cent greater than the rated boiler horsepower according to Cole's method.

This performance has been nearly equalled on other occasions. On September 26, hauling 11 cars weighing 823 tons, 3,404 indicated horsepower was developed at 40 miles an hour, and 3,464 indicated horsepower at 44 miles an hour. The indicator cards taken at these three speeds are reproduced in one of the illustrations.

Although accurate test data are not available, it is evident from the operating results obtained that the locomotive is rendering a highly satisfactory performance both from the standpoint of fuel economy and starting as well as speed capacity.

On 19 regular trips on the Wyoming, Western and Colorado divisions this locomotive made 62,592 passenger car miles on a fuel consumption of 338 tons, or at the rate of 10.8 lb. of coal per passenger-car mile. Comparing this with the April average for the main line division of the Union Pacific, this shows a decrease of 26 per cent.

Based on train resistance calculations the performance of the locomotive on the 2.2 per cent grade of the Oregon Short Line between Pocatello, Idaho and Butte, Mont., indicates that the locomotive developed a starting tractive effort of 58,000 lb. as compared with the theoretical rating of 54,800 lb. on the usual basis of calculation. A steam gage on the throttle pipe indicates that when working full stroke at low speed the pressure drop between the boiler and the steam chest does not exceed five to ten pounds. This, together with the 90 per cent cut off of the Young valve gear is responsible for the high starting tractive effort.

Although open to some question as to accuracy, calculations based on theoretical train resistance on the 1.55 per cent ruling grade west of Cheyenne indicates that the locomotive developed something over 2,000 hp. at 25 miles an hour, or approximately 12 per cent more than called for by the American Locomotive Company's tractive effort curve.

The engine has made a splendid impression among the crews who have operated it. This is undoubtedly partially due to its smooth riding qualities, particularly around curves, as well as its steaming qualities and ability easily to maintain schedules. The well balanced proportions of the machinery is attested to by the ability of the locomotive to operate continuously on runs varying from 500 to 700 miles in length.

Some of the Physical Properties of Paints*

New Method Used to Obtain Reproducible Films—Effects of Composition—Causes of Spotting

By P. H. Walker and J. G. Thompson
United States Bureau of Standards

THE LIFE of any paint may be divided into three periods: (1), the period of storage between manufacture and application; (2), the period of application when the paint is spread out in a thin, wet film, and (3), the period of exposure covering the life of the dry paint film. Each period is characterized by certain physical properties which indicate the value of the paint. During the first period little information of value is obtainable, but certain defects in manufacture or material may be indicated by such phenomena as flocculation, caking, or excessive settling. It is during the second period that the really valuable physical properties, such as the wetting power or adherence to the surface, ease of application, hiding power, color, uniformity, gloss, spreading rate, and rate of drying appear.

In the final stage of the life of the paint the only factors considered are those which affect the permanence or stability of the film established as a result of the properties which appear and function during the second period. All of these properties are important, but few if any can be measured with any degree of accuracy, and most of the properties are tested by methods in which the personal equation is so large that reproducible results can not be obtained. Any study of the physical properties of paints necessarily must begin with a standardization of tests.

Preparation of Paint Films

In view of the number and importance of the properties which first become evident at the time of application, it is obvious that this forms the logical starting point for any investigation. The physical properties which combine to determine the consistency or behavior of a paint at the time of application are of fundamental importance, but before any comparative study could be undertaken it was necessary to devise some reproducible method of preparing paint films. Flowing produces satisfactory results but unfortunately is limited to a few of the thinnest paints. The ordinary methods of brushing and spraying are unsatisfactory since the resulting films are never uniform and can be duplicated only by accident. Some mechanical means therefore must be employed and as a result of some promising preliminary experiments centrifugal force was adopted.

A number of circular glass plates furnished the standard surfaces to be covered with paint. These plates were each 25 cm. in diameter and approximately 1 cm. thick. The surfaces were ground flat and finished by fine grinding but were left unpolished, to furnish a surface to which the paints would adhere readily. In the earlier work steel plates were used but were later discarded, as the glass proved to be much easier to handle and to keep clean.

The apparatus employed consists of a vertical spindle rotated by a belt connected with a variable speed motor. To the upper end of the spindle is fastened a circular wooden block to support the glass plate. The plate is brought up to constant speed and an excess of paint, previously screened through a 200-mesh sieve to insure uniformity and freedom from skins, is poured on at the center of the plate. The paint flows out, covers the surface, and the excess is thrown off. The motor is then stopped and the plate removed and allowed to dry. After the paint is dry the film thickness is determined by means of an Ames dial gage, reading direct to 0.01 mm. and estimating to 0.001 mm.

At any given speed, the centrifugal force increases directly with the distance from the center of rotation. One would expect, therefore, that the resulting film would be thinnest at the circumference of the plate and would reach a maximum at the center. This is what usually occurs and the resulting film is generally pyramidal, although the pyramid does

*Abstract of a paper presented before the American Society for Testing Materials, Atlantic City, N. J., June 29, 1922.

not extend uniformly over the entire surface. The film usually presents the appearance of a large, flat plane with a small, sharply defined pyramid at the center. The pyramidal film which is characteristic of most paint is not produced by varnishes nor by liquids such as linseed oil. These give flat films of uniform thickness across the entire surface, in spite of the fact that the centrifugal force varies widely at different points on the plate. A table accompanying the paper gave the film thickness measured at varying distances from the center. Raw linseed oil gave a film about 0.016 mm. thick, varnishes 0.024 mm. to 0.040 mm., enamels and oil paints 0.030 mm. to 0.085 mm.

Numerous experiments with varying amounts of paint led to the conclusion that the film thickness is independent of the amount of paint applied. An insufficient amount will cover only a portion of the surface, while an excess will cover the entire surface and the excess be thrown off. The resulting films in both cases are of equal thickness at corresponding points, but for the sake of convenience it is advisable to use a slight excess to insure covering the entire surface.

At speeds of 200 r.p.m. or less many paints produce films too thick to dry properly. Too high speeds cause segregation of the pigment particles and in some extreme cases a tendency to disrupt this film has appeared. A speed of 300 r.p.m. seems to be the most generally satisfactory.

The film thickness is practically independent of the time of whirling after the first short interval of time has elapsed. Working with ordinary paints at a speed of 300 r.p.m., it was found that three minutes' whirling invariably provided a comfortable margin of safety beyond the time necessary to reach equilibrium.

The most satisfactory features of this method are the uniformity of the films produced and the ease and certainty with which they can be duplicated.

Effect of Composition on Paint Films

The next investigation was a study of the effect produced upon the life and behavior of a paint film by varying the proportions of pigment and oil in the film. For comparative purposes the films should be of equal thickness and the use of centrifugal force as previously described furnishes a convenient means for determining the film thickness which will result when any paint is spread under certain selected conditions. If several paints produce films of equal thickness when whirled at the same speed, it may be assumed that those paints will produce comparable films when brushed out on test panels. The object sought was to produce a series of paints of varying oil-pigment ratios thinned with turpentine until they would spread or brush out to produce dry films of equal thickness.

Four pigments were selected for study:

(a) Basic carbonate white lead.

(b) Zinc oxide.

(c) Sixty per cent basic carbonate white lead, 40 per cent zinc oxide.

(d) Sixty per cent basic carbonate white lead, 30 per cent zinc oxide, 10 per cent asbestine.

Each pigment was ground to a paste with a normal amount of raw linseed oil. Each paste was divided into several weighed portions and varying amounts of oil were added to the different portions until the resulting series of semi-pastes or semi-paints represented a range of pigment content varying from 15 to 50 per cent by volume. The corresponding limits for the oil being 85 and 50 per cent by volume. Liquid drier was added to each semi-paint in the proportion of 5 cc. of drier to 95 cc. of oil.

Some one mixture had to be chosen as an arbitrary standard and that consisting of 25 per cent basic white lead and 75 per cent oil was adopted, since this mixture behaved well under the brush and produced a film of satisfactory appearance and properties. The other mixtures were thinned with turpentine until they produced the same film thickness when whirled at the same speed. The turpentine being volatile serves merely to increase temporarily the mobility of the paints and later evaporates.

The preparation of the paints resulted in some interesting observations. As expected, it was found that the thinning power of turpentine varies with the different pigments, but it was rather surprising to find a variable thinning power for any one pigment depending upon the composition of the vehicle already present, as appeared in the cases of the zinc oxide and mixed pigments. It is difficult to draw conclusions regarding the consistency of the paints from the data, since the thickness of the wet films will vary widely although the dry films are all of equal thickness. Nevertheless, there is unmistakable evidence that the thinning power of turpentine not only varies with different pigments, but also varies for any one pigment with the composition of the mixture being thinned.

Causes of Spotting in White Lead Paints

It is generally believed that a paint resulting from the thinning or breaking up of a basic carbonate white lead paste should be allowed to stand for a day or two before being used. The probable reason for the origin of this belief was found when a white lead-oil-turpentine paint was used immediately after mixing, flowing the paint on a clean glass plate to form a smooth wet film. In the course of a few minutes small pits appeared on the surface of the film and gradually increased in depth and diameter. The phenomenon appeared over and over and could not be ascribed to any fault in the preparation of the surfaces painted. The same result was obtained no matter whether the paint was applied to glass, steel, or to a previously dried coat of paint.

Summarizing the results of many experiments, it appears that the spotting tendency:

(a) Is common to all mixtures of basic carbonate white lead and raw linseed oil.

(b) Does not appear when other pigments are substituted for the basic carbonate white lead.

(c) Does not appear when other oils are substituted for raw linseed oil.

(d) Is not due to too much stirring or to lack of stirring; presence or absence of liquid driers and volatile thinners; order of mixing; presence of free fatty acids, mineral acids, or water, although any or all of the foregoing factors may at times exert a modifying influence.

(e) May be explained upon the assumption of a reaction between the basic carbonate white lead and some unidentified portion of the oil.

(f) May be eliminated by boiling the oil in the presence of driers which may convert the troublesome component to an inactive form; by treating the raw oil with basic carbonate white lead during storage prior to its use; or by aging the paint to allow the reaction to reach completion before the paint is applied.

TWO AND A HALF BILLIONS is the total number of passengers carried by rail in local New York City traffic, in the year ending with last June, as reported by the State Transit Commission, an increase of 98½ millions over the preceding year; or from 2,491,909,178 to 2,590,313,728. These totals represent the business of the surface, subway and elevated lines. About 60 per cent was handled by the rapid transit routes—subway and elevated lines—while 40 per cent was carried by the surface lines. More than three-fourths of the increase appears in the reports of the surface lines, which handled 75,316,859 more paying passengers than in 1921. On the Manhattan elevated lines of the Interborough system, the loss was 25,776,235 as compared with 1921. The Sixth avenue elevated has suffered from the opening of the new Broadway subway, operated by the Brooklyn Rapid Transit Company.

Employee Representation on the Pennsylvania

Employees Have a Voice in the Management in Matters in Which They Are Directly Concerned

THE SHOPMEN'S STRIKE has tended to focus attention upon the efforts which have been made by the Pennsylvania System to bring about "a spirit of mutual understanding and cordial co-operation between management and employees." The road, because of the widespread interest in its methods and the many requests for information about them, has issued a statement telling of the origin, development and achievements of the plan.

The introduction to the statement contains these words:

"No illusions are entertained by the management that is has found a panacea for all the ills that afflict present day relationships between employers and employees. It is believed, however, that the employees and officers of the Pennsylvania System have adopted a policy and practice in their own dealings with each other, which, if lived up to by both in a spirit of sympathetic understanding, mutual co-operation and fair play, will materially benefit all who are connected with the railroad, and will be reflected in a higher standard and a larger measure of service to the public. The performance of the Pennsylvania System during the period of the shopmen's strike and the demonstration of loyalty on the part of its employees under most trying circumstances offer a practical and substantial foundation for that belief."

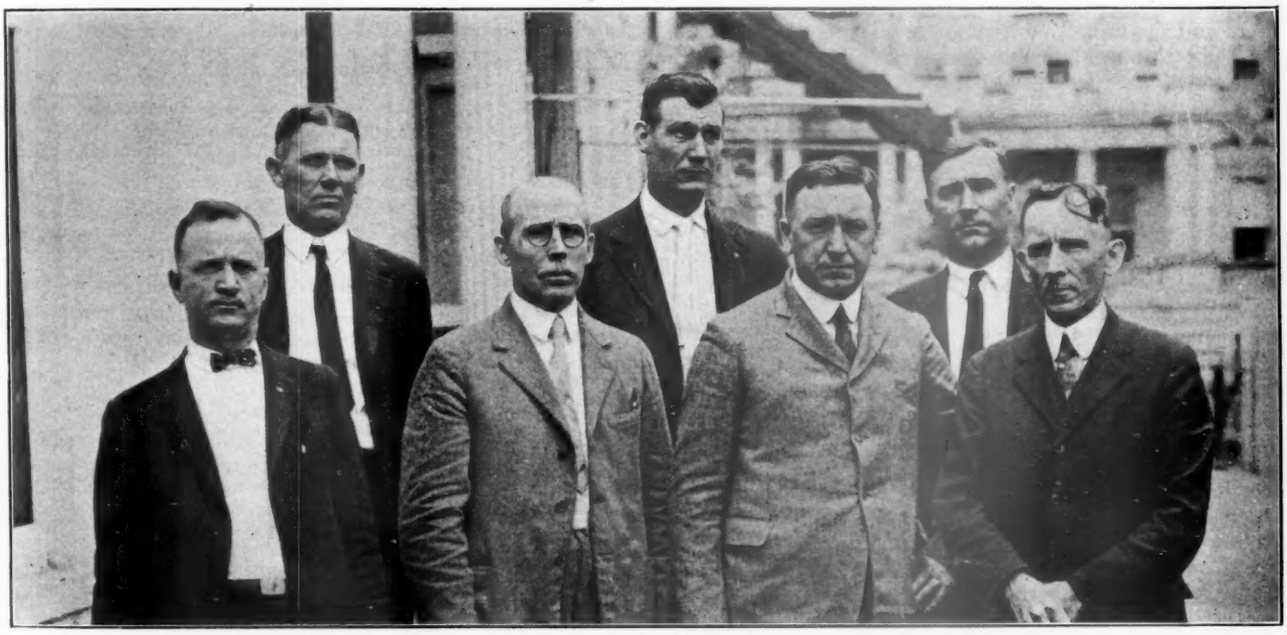
The article which follows is made up of liberal extracts from the statement. We have omitted, however, material concerning certain details relating to the extensions of the plan to other classes of employees than those engaged in train service; also the reproduction of notices informing the employees of the elections, typical ballots, and graphic charts showing the structure of the committees and the steps to be taken in handling controversial questions with the management. The appendix of the booklet contains also a typical set of by-laws jointly formulated by employees and management governing procedure under the plan of employee representation; it also contains the constitution of the Altoona Works Employes' Association.

Purpose and Origin

The policy and practice of the Pennsylvania System in its relations with employees may be summarized in one sentence: To give all employees an opportunity to have a voice in the management in all matters affecting their wages, working conditions and welfare, and in other matters of mutual concern affecting the welfare of the company and of the public which the company serves.

"What we want," said General Atterbury, early in the negotiations with the employees, "is committees of employees, whose orders come from the bottom, from the men at work on this railroad, and are not handed down from the top by some people we know nothing about. We shall be better off by far if we have our agreements and negotiations between ourselves—then we understand them." This policy is based on the belief that the interests of the employees, the company and the public can best be served by bringing about mutual confidence, sympathetic understanding and real co-operation between employees and management. It is essential to these conditions that the relationship between employees and management be direct, frank and friendly, without interference on the part of persons or organizations having interests to serve other than those of the railroad, its employees and the public.

It is recognized, of course, that an employee has a right



Shop Craft Representatives at White House Where They Appealed to President Harding in Behalf of Loyal Pennsylvania Employees

First row—left to right: P. M. Hughes, General Chairman, Electrical Workers; Wm. Donahue, General Chairman, Blacksmiths; T. H. Davis, General Chairman, Eastern Region; J. J. McBride, General Chairman, Machinists. Second row—left to right: E. C. Arnold, General Chairman, Sheet Metal Workers; H. H. Emberger, General Chairman, Boiler Makers; E. R. Snyder, General Chairman, Carmen.

to join or not to join any organization as he sees fit, but membership or non-membership in any organization does not concern the management in the practice of the policy on which the officers and the employees have mutually agreed. The primary requisite is that the employees and the management deal directly with each other; that spokesmen for the employees be employees themselves, chosen by the employees, speaking and acting for the employees, and not taking orders from or acting for persons or organizations outside the Pennsylvania System.

Such a basis is fundamentally sound. It is of paramount importance in the interest of the public, which requires adequate, efficient, economical and uninterrupted transportation service, by reason of the fact that the sympathetic strike, the closed shop and restriction of output are countenanced and practiced by certain organizations which during the period of federal control very largely extended their membership among railroad employees.

Prior to federal control the Pennsylvania had an enviable reputation of always treating its men fairly, and the esprit de corps among Pennsylvania men was one of the distinguishing characteristics of the railroad's service. For a period of many years prior to the Railroad Administration there was no serious strike or disagreement between the officers and the men. Every employee understood that he had the right to appeal to the general manager. Substantial justice was done to all, and the employees as a body were satisfied, and worked in close co-operation with the officers of the company.

The management had, many years ago, satisfied itself that the committees with which it dealt on behalf of engine and train service employees did actually represent Pennsylvania Railroad employees in this service. Furthermore, at the termination of federal control, their same committees continued practically intact, and nothing has since transpired to affect the relationship already established between them and the management.

On the other hand, although it had been understood that the status quo, as far as labor organizations were concerned prior to federal control, would be maintained during federal control, the fact is that organization of railroad employees into national and international unions was promoted under the Railroad Administration, and railroad officers were ordered to keep their hands off. The result was inevitable. At the end of federal control, the management found national and international organizations of the character already referred to, superimposed on our employees, regardless of their desires, and representatives of these organizations presuming to speak and act for our employees.

During the so-called "guarantee period" lasting six months after federal control, it was impossible to alter this situation. The Transportation Act, however, required employees and management to get together and adopt every reasonable means of settling amicably all controversial matters liable to interrupt transportation. It was the belief of the management that this was impossible under existing conditions, which constantly jeopardized amicable relations with its employees. The best interest of the public, as well as the company and its employees, themselves, it was felt, demanded closer relationship between employees and officers, and every endeavor should therefore be made to bring about co-operative effort in serving passengers and shippers.

In order to re-establish the harmonious relationships existing between employees and officers prior to federal control, the Pennsylvania System adopted a policy of giving employees a voice in the management and announced a plan of employee representation. Steps toward the development of the plan were taken soon after the return of the railroad to its owners. Informal discussions were held with representatives of various groups of employees looking to a more representative and more satisfactory means of disposing of controversial matters than had been in effect up to that time.

First Steps in Developing Plan

The first definite step was taken at a joint meeting of officers from all parts of the system and representatives of the employees in engine and train service—the engineers, firemen, conductors and brakemen. All the local divisional chairman representing these employees attended. The meeting was held in Philadelphia on December 21, 1920. This meeting was the forerunner of many similar meetings with these and other groups of employees, and it laid the foundations of the present plan. General Atterbury, who addressed the officers and employee representatives in joint session, sounded the keynote of the company's policy when he said: "The successful solution of the problems that are before you, if carried to a logical conclusion, means that not only will there never be a strike, but that it will never be necessary to take a strike vote on the Pennsylvania System. It should mean the setting up of proper machinery for the prompt consideration of changed working conditions and of grievances, and, finally, that failing to agree between yourselves on a settlement of any of these questions, there shall have been provided beforehand the machinery of a tribunal to which the question can be submitted for final decision."

Outline of Policy

Outlining the purposes of the plan that he proposed, General Atterbury said: "This occasion is unique. Never before, so far as I know, have the officers ever invited the representatives of the employees to a conference. Heretofore request has come from the employees, and then only when they had something to ask in the way of increased wages, or improved working conditions, or adjustment of grievances. As representatives of the employees, you are vitally interested in a pleased patronage and an aggressive, business-getting organization. To you it means *greater earnings, more regular employment,* and *earlier promotion.*

"We have heard a great deal the last few years of collective bargaining. One hardly knows what the theorist means by collective bargaining. But if by collective bargaining you mean the employees and the management sitting down to seriously discuss working conditions, and a schedule results which is mutually satisfactory, then we have had collective bargaining in force for at least 17 years.

"This meeting today is in continuance of that policy. Some 310 men are here representing approximately 51,000 men, or nearly 30 per cent of all of our employees. You are the men in the train service—the most responsible; the most highly organized; and, generally, the most highly paid. In all these 17 years years, although occasionally strikes have been threatened, never once has a strike been called. We have always been able to compose our difficulties. You represent the conservative in labor organizations. You neither practice nor advocate the closed shop, nor the sympathetic strike; nor can a strike of your organizations be called without its being properly submitted to your membership by ballot. You do not intentionally through your schedule limit production, as the combination of 'Day' and 'Mileage' is piece work, pure and simple.

"The railroad officers who are present represent the management of a property in which about two billion dollars is represented, approximately half of which is in bonds, and the other half in stocks. The bonds are largely owned by life insurance companies, savings banks, and other financial institutions, and in the stability of these bonds a very large majority of the people of the country are directly or indirectly interested, through their life insurance policies, or their deposits in the savings banks.

"The other half of this great investment—that is the stock

—is owned by some 140,000 stockholders, of whom about one-half are women. Bear in mind that the policy of the Pennsylvania management has never been to pay large returns to its stockholders. The aim has been to assure to stockholders a reasonable return, upon which they could depend. Furthermore, the Pennsylvania Railroad has no watered stock, and the records will show that over a period of nearly 75 years it has paid regular dividends to its stockholders averaging approximately six per cent.

Three-fold Duty of Management

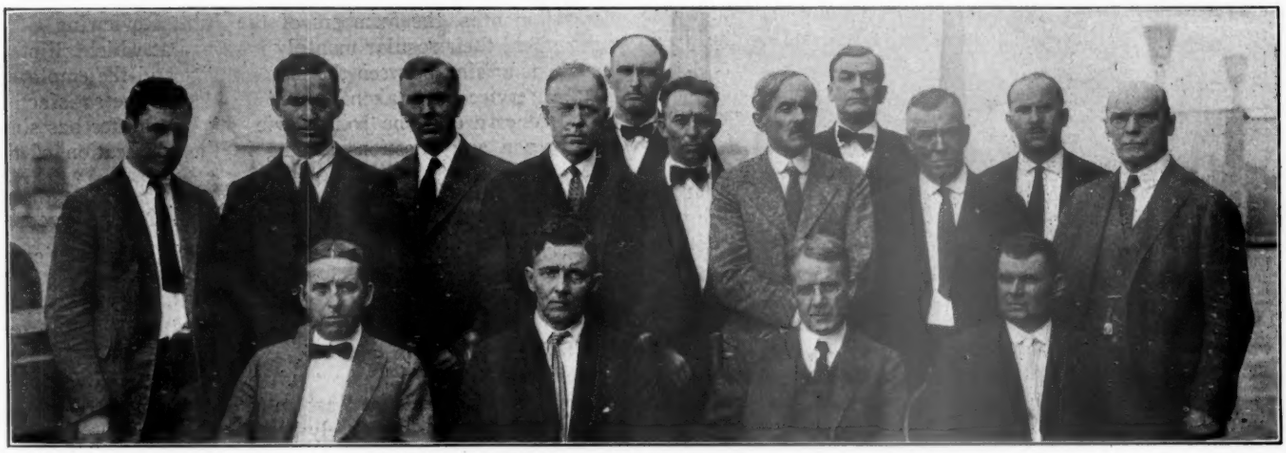
"The duty of the management is three-fold. They have a direct duty to see that the capital already invested shall be given a fair return. Surely that duty is owed to those who have entrusted their money to our care. Further, if a fair return is not paid, new capital for improvements, extensions and betterments cannot be obtained. The management also have a duty to the public. If the railroad is granted reasonable and fair rates, the public, in return, is entitled to efficient and satisfactory service. Last, but not least, is the duty of the management to the employees—that is, good wages, good working conditions, and discipline fairly and impartially maintained. Kindness, courtesy and consideration are not incompatible with good discipline. Lax discipline is not kindness, for in your occupation lax discipline spells death, and disaster.

"The employees equally with the management have their responsibilities. Given fair wages and fair working conditions, the management has the right to expect and exact from the employees an honest day's work; prompt, willing and cheerful observance of orders; and economical use and care of the property entrusted to them. The management has the right to ask the same kindness, courtesy and consideration to the officers and to the public on the part of the employees which the employees have the right to expect from their officers.

"I have tried to lay down a simple platform of principles on which you, as officers and employees, can meet. I have given you jointly certain questions to solve. The spirit in which you approach these questions will determine the success with which they are settled. I have no doubt that there are many petty grievances on both sides. Forget them for the time being. Each put himself in the place of the other, and see if he cannot understand the other fellow's side."

The result of this meeting was the joint formulation of a plan and procedure whereby all questions of a controversial character arising between the employees in engine and train service and officers of the company would be handled in an amicable way, and settled if possible without intervention by outside parties. A "memorandum of understanding" was formulated and signed covering the method to be followed in the adjustment of all disputed matters. Because this memorandum, in its purpose and effect as well as in the spirit in which it was negotiated, became the basis of similar negotiations and understandings affecting employees in other branches of the service, its provisions are given somewhat in detail. The preamble reads: "The outline of the method in which controversial matters are to be handled as given below is for the purpose of expeditious adjustment of matters presented, to the end that there may be a satisfied spirit among the officers and employees and it is important, therefore, that so far as is possible, decisions will be reached at the time of meeting, such decisions to be confirmed in writing as promptly thereafter as is possible. This plan for handling schedule and other matters can be successful only by full and conscientious co-operation on the part of both the management and employees, and it is expected that when questions are presented for disposition that the spirit of absolute fairness will be the factor in adjusting these matters."

The memorandum is a complete exposition of the procedure to be taken in every step of the way from the division superintendent and the local chairman representing the employees in his territory on up to the Joint Reviewing Committee which is the final arbiter in the disposition of any matter referred to it.



Shop Crafts' Southwestern Regional Reviewing Committee

Back row—left to right: Arthur Fischman, Secretary; L. S. Osmer; W. C. Higginbottom; W. C. A. Henry; F. S. Owen; J. L. Deem; G. B. Fravel; Taber Hamilton; J. F. McEvoy; C. R. Perin; J. E. Mechling. Front row seated—left to right: R. K. Rochester; J. E. Cavey, Vice Chairman; E. B. Dithridge, Chairman; H. W. Daringer.

Essential Features of Method Adopted

In general, the essential features of the method adopted are these:

First Step.—Monthly meetings between each division superintendent and the local chairmen representing the engine and train service employees, at which all controversial matters arising on the division may be taken up with five days' advance notice by either party of the subject to be discussed.

In questions relating to schedule matters, when there is agreement between the superintendent and local chairmen, it is put into effect at once and the interpretation agreed upon is referred to the Joint Reviewing Committee for review. When there is a disagreement on the division, and no interpretation of the question has been made by the Joint Reviewing Committee, the matter is referred to the Joint Reviewing Committee for decision.

In each case, however, copy of the interpretation agreed

upon or the joint statement of facts, where there is disagreement, is forwarded to the general superintendent and general manager for their information.

In discipline and other matters when appeal is taken from the decision of the division superintendent, the question goes next to the general superintendent in charge of a general division (which includes several divisions).

Second Step.—Monthly meetings between each general superintendent and the general chairmen representing the engine and train service employees, at which controversial matters on which the local chairmen and division superintendent have been unable to agree are discussed with five days' advance notice by either party of the subject to be discussed. In questions relating to schedule matters, the same procedure is followed as with the division superintendent. In other than schedule matters, in case of disagreement, the question is referred next to the general manager in charge of the region.

Third Step.—Monthly meetings between each general manager and the general chairmen representing the engine and train service employees, at which controversial matters on which there has been a disagreement with the general superintendents are discussed with five days' advance notice by either party. In questions relating to schedule matters the same procedure is followed as with the division and general superintendents. In other than schedule matters, where there is disagreement, the question is referred to the Joint Reviewing Committee for decision.

Fourth Step.—Monthly meetings of the Joint Reviewing Committee, at which all matters in which there has been a disagreement and an appeal taken from the division or general superintendent or general manager, are discussed. The whole schedule of monthly meetings is so arranged that the general chairmen are enabled to cover the meetings with general superintendents and general managers throughout the system and carry matters through to the Joint Reviewing Committee without delay.

Keystone of Plan Is Joint Committee

The Joint Reviewing Committee for the engine and train service employees and similar bodies for employees in other classes of the service, constitute the keystone of the arch of satisfactory industrial relations on the Pennsylvania System. It is the highest authority on the railroad in the settlement of matters in dispute between employees and management. Its decisions are final and it is the final arbiter in the determination as to how any matters on which it is unable to reach a decision shall be decided. Executive officers of the company cannot interfere with its prerogatives.

The text of the "Memorandum of Understanding" in this particular is therefore quoted verbatim:

MAKE-UP OF JOINT REVIEWING COMMITTEE

20. The Joint Reviewing Committee shall consist, for the management, of two representatives from each region of the system; for the employees, the general chairmen of the engine and train service employees, which, as at present constituted, consists of nine members.

METHOD TO BE FOLLOWED BY JOINT REVIEWING COMMITTEE

21. In all matters other than discipline the entire committee will sit.
22. In cases of discipline the representatives of the management in the region where the case arises, together with the representatives of the employee involved in that region where the case arises will not sit on the committee but will present the case to the remaining members of the committee, who will hear and determine the matter at issue.
23. The management and the employees will have equal voting power and not less than a two-thirds vote will be necessary to reach a decision.
24. In case a decision is not reached by the Joint Reviewing Committee not later than subsequent monthly meeting at which the case was first brought up, further procedure will be had as determined upon at the time of such disagreement.
25. Meeting place of the Joint Reviewing Committee will be fixed from time to time by the committee.

The chairmanship of the Joint Reviewing Committee alternates every six months between the management representatives and the employes.

New Schedule of Rules Negotiated

One of the first tasks undertaken by the representatives of these employees and the representatives of the management was the formulation of a new schedule of working conditions. Prior to the formation of the Joint Reviewing Committee the men in engine and train service had been working under six different schedules, one for the former Lines East and one for the former Lines West, and one each for the Vandalia, Grand Rapids and Indiana Railroads, C. L. & N., and N. Y. P. & N. Due to the fact that prior to the end of federal control the Pennsylvania System had not been operated as a unit, there were many points of difference between the schedules and many disputed questions involved in each of the schedules themselves.

When the Pennsylvania Railroad resumed the management of its property on March 1, 1920, however, the system was reorganized as a unit with four operating regions and Altoona Works. When employees in engine and train service requested that a system schedule be established which would harmonize the difference between the existing schedules and settle points of controversy within the schedules themselves, the members of the Joint Reviewing Committee assumed the task and constituted themselves a schedule committee to work out the new arrangement.

In addition to this work, which was under negotiation for several months, the members of the Joint Reviewing Committee held their regular monthly meetings at which all other questions arising between the management and the employees in this service were taken up and decided to the satisfaction of all concerned. The Joint Reviewing Committee has since acted upon any questions arising in the application of the new schedule.

Extension of Plan to Other Classes of Employees

Obviously the working out of the plan already adopted by the employees in engine and train service for local self-government had been watched with considerable interest by other groups of employees and its practical workability was beginning to be demonstrated. To an appreciable degree, therefore, the proposal to extend this policy to other classes of employees met with at least an interested response.

Owing to conditions largely brought about under the Railroad Administration there was a great deal of skepticism as to the sincerity of the management, but it was felt by the more constructive leaders of the employees that the experiment might be worth trying. On the part of the officers the utmost frankness was observed and the employees' spokesmen were invited to participate and assist in working out the details of the proposed election.

When the Labor Board issued its Decision No. 119, respecting the negotiation of new schedules of regulations, and the company announced its policy of instituting a plan of employee representation, the employees generally were in a receptive mood to consider the actual details and to participate in making it effective. The then spokesmen of the signalmen and maintenance of way men actually participated in the preparation of the election machinery.

Accordingly arrangements were made to call into conference with the officers the general chairman and committee of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers and later on the general chairman and committee of the Brotherhood of Railway Signalmen of American.

It was pointed out to these men and their committees some of the undoubted good that would result both to the employees and the management if jointly a plan could be devised for them which would provide home rule, popular elections of employee representatives, participated in by all employees coming within their respective groups, a voice in the management in determining their wages and working condi-

tions, and as part of the necessary machinery, a tribunal consisting of an equal number of representatives of the employees and the management, who would sit as a high court and decide all controversial questions properly brought before them.

A complete election procedure was worked out and fully explained to the employees in notices posted on the bulletin boards. The ballots themselves also contained a complete and definite explanation of the machinery provided for them to exercise their right of franchise in the choice of representatives to deal with the management on behalf of the employees in the various classes.

Steps were also taken to meet spokesmen for the other classes of employees with a view to explaining the plan to them in detail. These groups included: shop crafts; telegraphers; clerks; miscellaneous forces (office, station, warehouse, storehouse and elevator forces, and engine and train crew callers, excluding the strictly clerical and supervisory forces); stationery engineers (steam), and firemen and oilers; marine department employees; dining car and restaurant service employees and the employees in the various administrative departments of the general offices.

Essential Features of Election Plan

The essential features of the election procedure were these: All employees were given an opportunity to elect employee representatives by secret ballot; all employees in the respective classes were eligible to vote; no candidates were named or suggested by the management or printed on the ballots; any employee, whether union or non-union member, was eligible for election; employees wrote on the ballot the names of their choice; the ballots, in sealed envelopes, were opened and counted in the presence of representatives of the employees and the management; employees receiving the largest number of votes were recognized by the management as empowered to speak and act for the employees participating or entitled to participate in the election.

How Secrecy of Ballot Was Insured

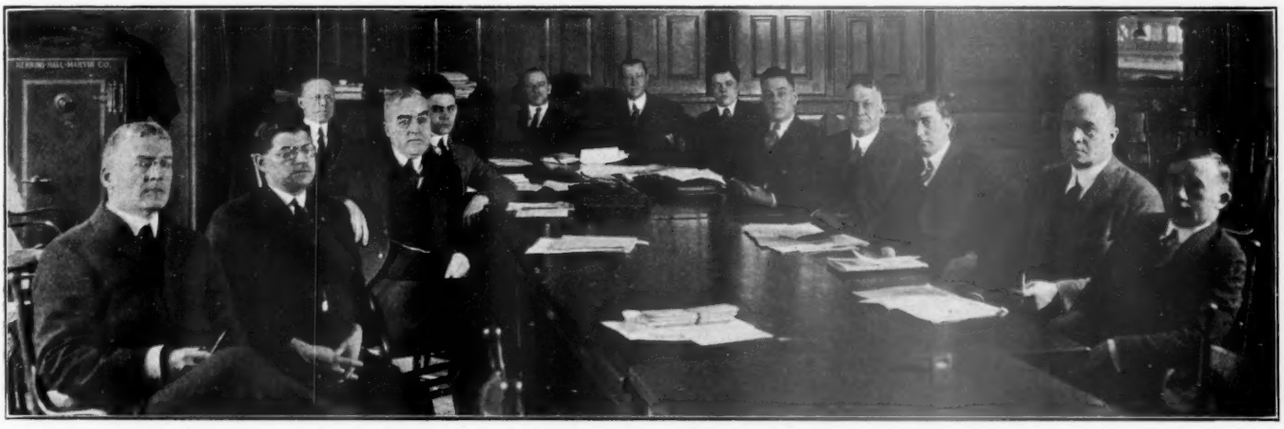
The ballot itself, contained in a sealed envelope, was enclosed in another sealed envelope by the voter. On the outside of the latter envelope appeared the voter's name, occupation, location and division for the sole purpose of checking the names of the voters against the payrolls to see that only employees had voted. These outer envelopes, however, were destroyed in the presence of representatives of the employees and the management before the sealed envelopes containing the ballots themselves were opened. This procedure insured absolute secrecy of a man's vote.

The ballots themselves were opened and counted in the presence of and by representatives of the men and the management. There was absolutely no way in which the name of a man voting could be identified with his ballot.

No better evidence of fairness and impartiality upon the part of the company could be offered than the fact that some classes of employees elected all union men to represent them, and the management is now dealing with these elected representatives.

In the case of the signalmen, maintenance of way employees and telegraphers, solid union committees were elected. The employees who were members of the union received the highest number of votes and the management recognized them and immediately entered into negotiation with them with a view to formulating rules covering working conditions which would be mutually satisfactory. In the case of some of the other classes, some union and some non-union men were elected and the same procedure was adopted.

The first business before these elected representatives was of course the question of new schedules of working conditions and the employee representatives and representatives of the management immediately took this matter in hand. When it had been satisfactorily concluded, however, request was made by the employees that permanent machinery, similar to the Joint Reviewing Committee for engine and train service employees be jointly established for other groups. In general, therefore, the plan of employee representation ultimately worked out for all classes of employees was based largely upon the memorandum of understanding already entered into by the management and the general chairmen of the engineers, firemen, hostlers, conductors, trainmen and switchtenders.



Regional Joint Committee of Clerical Employees, Eastern Region

Left to right—H. M. Carson, General Superintendent, Central Pennsylvania Division; J. R. Rudolph, General Chairman, Philadelphia Terminal Division; H. E. Enochs, Superintendent, Wage Bureau; R. V. Massey, Assistant General Manager; M. T. Miller, Regional Chairman; J. A. McLaughlin, General Chairman, Southern Division; F. W. Smith, Jr., Special Agent, Eastern Pennsylvania Division; E. S. Werntz, Secretary; Oscar Howe, General Chairman, Eastern Pennsylvania Division; A. B. Clark, Superintendent, Trenton Division; F. J. Garren, General Chairman, New Jersey Division; F. W. B. Humes, Superintendent, Stations and Transfers; E. A. Kidney, General Chairman, General Superintendents' Departments.

Plan of Procedure for Handling Disputes

That is, the plan included:

1. Local committees for the division and general divisions. Regional and system committees for the handling of matters appealed from the divisions and general divisions.

2. Joint committees, similar to the Joint Reviewing Committee already described, composed of equal representation of management and employees, all members having equal voting power with two-thirds vote necessary to decide any issue.

3. By-laws governing procedure of these committees, schedules of meetings with division, general division superin-

tendents and general managers and future election machinery for the election of successive employee representatives at regular periods.

Naturally there are variations from this general plan to meet special conditions such as exist at Altoona Works, but the policy and practice throughout are the same in principle.

Controversy With Labor Board

Of all the groups of employees, System Federation No. 90, Railway Employees Department, American Federation of Labor, and a minority of the clerks, members of the clerks' union, objected to any plan of voting by the employees which did not place the name of their organizations on the ballot as a candidate. System Federation No. 90 was largely imposed upon the employees in the shop crafts during the period of federal control and the management was not satisfied that it actually represented the wishes of the majority of the shop employees on this railroad.

The officers of this organization insisted that they had the right to represent Pennsylvania employees and in a conference similar to the meetings with other groups when the details of the plan were being worked out, they declined to participate in the election machinery which had been agreed upon with the spokesmen for the other groups unless the name of their organization was placed on the ballot. They maintained that they as an organization be recognized as representing all the shop craft employees.

Nevertheless the elections were held. Officers of System Federation No. 90, however, persuaded employees not to vote in the elections and many of the shopmen refused or failed to exercise this right. As a matter of fact, if they had so desired, and as was clearly explained to them, the union officers who were employees could have nominated themselves as candidates, just as the union officers in the signal, maintenance of way and telegraph departments did, and if elected would have been so recognized by the management. Furthermore there was no objection to a voter's placing organization initials or symbols after the name of the candidate for whom he voted. In the case of every one of the signal committeemen elected, the initials B. R. S. of A. appeared after the candidate's name on the ballots voted by signal department employees.

In the case of the shop crafts, employee representatives were elected by those employees who did vote and the management recognized them and negotiated new schedules of working conditions with them. These schedules have been in effect since and have worked with mutual satisfaction to the great majority of the shop employees and of the management.

The United States Railroad Labor Board, without, as it is believed, any authority under the Transportation Act, declared said elections illegal and the contracts entered into between the management and the elected employees representatives null and void and ordered a new election in the shop crafts. (Decision No. 218.)

Not only that but the board declared that the organization itself must have a place on the ballot and must be recognized as entitled, if selected by the majority of the employees, to represent them, that other than employees could represent Pennsylvania employees and that men who had ceased to be employees were eligible to vote.

The management stood by the elections already held and when the Labor Board was about to publish an opinion that the company had violated its decision, the company adopted the only method open to it to test the power of the Labor Board to make the order which it had made and instituted a proceeding in the United States Courts to restrain the board from publishing such an opinion. The United States District Court upheld the Pennsylvania System and granted an injunction. The Labor Board appealed and the Circuit Court of Appeals reversed the District Court and the Pennsylvania has taken the case to the United States Supreme Court.

The Pennsylvania Railroad Company raised two main points:

1. That the order of the Labor Board in this case was beyond its authority under the Transportation Act; that the company therefore had not violated any lawful decision of the board and that the board should be restrained from publishing an opinion to that effect.

2. That if the Labor Board did have authority for its order, then the sections of the Transportation Act giving it such power were unconstitutional.

Summary of Company's Position in Controversy With Labor Board

The railroad position throughout the course of the argument before the Labor Board and before the court may be summarized as follows:

1. The company has not denied and does not now deny the jurisdiction of the Labor Board to hear and decide such disputes as fall within the purview of Title II of the Transportation Act.

2. The company does deny the right of the Labor Board to invade the domain of management and insists that in declaring said election illegal and said contracts null and void, and in ordering that a new election be held as it did in its Decision No. 218, the board exceeded its powers and without warrant of law exercised the functions of an administrative or regulatory body, and asserted jurisdiction over matters solely referable to the functions of railway management.

3. In its relations with its employees, the company seeks one object and one alone namely, the right to deal directly with its own employees without interference by those having interests to serve other than the interest of the employees, the railroad and the public. To that end it has offered classes of employees a voice in matters affecting their welfare through employee representatives of their own selection, whether union or non-union men.

4. Sixty-six and one-half per cent of the employees who are interested in and affected by rules covering working conditions have by vote or otherwise expressed a desire to negotiate rules and working conditions through employee representatives, and contracts have been entered into between the management and representatives of approximately 150,000 employees.

5. Representatives of the various classes of employees with whom contracts have been made have expressed their satisfaction not only with the manner in which representatives were elected, but also with the rules and working conditions agreed upon.

6. If the company complied with the Labor Board's decision No. 218, it would be obliged to repudiate these contracts to the great and irreparable injury of the company and its employees.

How the Plan Has Worked Thus Far

It would seem that there could scarcely be a more severe test of the Pennsylvania plan of employee representation than that afforded by the national strike of railroad shopmen which began on July 1, 1922. Not only has it afforded a successful demonstration of the co-operative policy adopted by the company and its employees in general, but also it has furnished practical proof that System Federation No. 90 does not actually represent the majority of the shop craft employees on the Pennsylvania System.

The strike vote on which the shop craft employees on the Pennsylvania System were called upon to strike was taken when the company refused to hold a new election as ordered

by the Labor Board in 1921. The company was not a party to the issues which precipitated the general strike. The issues on which the strike was called did not apply to this railroad. Wages had been fixed by mutual agreement; rules had likewise been determined and had been in effect for almost a year; and no outside contract work of the kind complained of by the strike leaders had been let by this railroad.

Bearing in mind that System Federation No. 90 had claimed the right to represent the shop crafts and had been sustained by the Labor Board to the extent that a new election was ordered, the strike call on the Pennsylvania really amounted to a protest against the Pennsylvania plan of employee representation.

Disposition of Grievances and Controversial Questions
(First Six Months of 1922)

MONTH	No. of Cases Taken Up	Adjusted or Compromised in Favor of Employes	Percent	Withdrawn No Merit, etc.	Percent	Decision Appealed	Percent	Received By Reviewing Committees	Decision in Favor of Management	Percent	Decision in Favor of Employes	Percent	Withdrawn No Merit, etc.	Percent
January	896	435	48.5	256	28.6	205	22.9	18	11	61.1	6	33.3	1	5.6
February	937	441	47.1	279	29.8	217	23.1	10	8	80.	1	10	1	10.
March	868	412	47.5	224	25.8	232	26.7	6	5	83.3	1	16.7	—	—
April	733	341	46.5	209	28.5	183	25.0	—	—	—	—	—	—	—
May	996	535	53.7	237	23.8	224	22.5	5	1	20.0	3	60.0	1	20.0
June	771	389	50.4	204	26.5	178	23.1	59	24	40.7	9	15.3	26	44.0
Total	5,201	2,553	49.1	1,409	27.1	1,239	23.8	98	49	50.0	20	20.4	29	29.6

Note: This statement is designed to show the disposition made of grievance cases and controversial questions by the various officers with whom such cases were taken up, and represents the procedure followed in handling these matters from origin to final disposition.

It does not, however, show the final disposition of all cases originating or taken up with higher officers, for the reason that in cases where the decision of an officer below the superintendent or of a superintendent is appealed successively to the general superintendent, the general manager and the reviewing committees, such cases would not ordinarily be finally disposed of during the period of one month.

The number of cases shown as having been taken up with and disposed of by higher officers and the reviewing committees may or may not be included in the number of cases reported as having been taken up with and disposed of by the officer next lower in rank, depending upon whether the case was handled during the month by the officer next lower in rank.

Employees Repudiate Fancied Grievances

Certainly if the majority of the shop crafts were dissatisfied either with their wages and working conditions or with the methods of election followed by the company, or the procedure adopted for the settlement of matters in dispute, no more propitious occasion for indicating such dissatisfaction could be presented than a strike by shopmen all over the country.

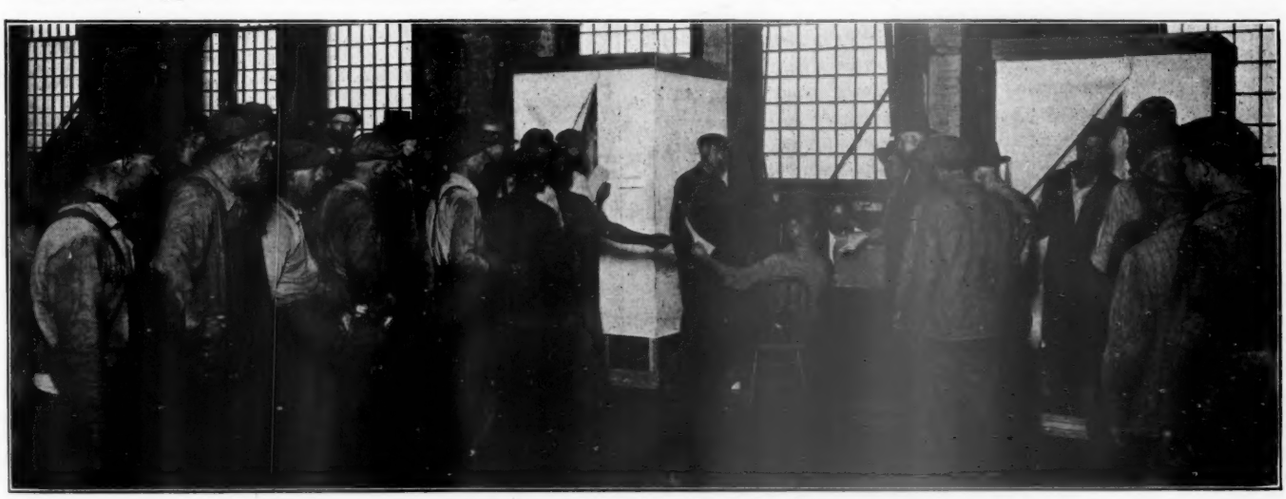
But what happened was this: Less than 30 per cent of the Pennsylvania shopman left the service when the strike was called. Within two months after the strike started the shop forces of the system had been restored to more than 95 per cent of the normal working force. The great majority of the employees who remained loyal were working under regulations that had been agreed upon between the management and the employee representatives elected the year before—the election which the Labor Board had declared illegal. They were working under wages agreed upon between the management and the same employee representatives.

Practical Demonstration of Success of Plan

It would be difficult to imagine stronger proof of the fact that the great majority of even the shop craft employees are satisfied with the Pennyslvania plan.

Ever since the plan has been in effect, however, it has furnished practical demonstrations of its workability and the confidence of the employees. A study of the disposition of grievances and controversial questions arising between employees and the management in the first six months of this year affords interesting evidence as to how the Pennsylvania System plan of employee representation is actually working.

This is the second year in which it has been in effect.



Voting Booths at Planing Mill for Shop Employees' Election at Indianapolis, Ind.

The analysis of the records of the first half of this year covers not only engineers, firemen, conductors and trainmen, but also shop craft employees, signal department, maintenance of way, clerical employees, telegraphers, marine employees and miscellaneous forces. It includes such questions as seniority, discipline, time allowances and other matters that arise in dispute in the ordinary operation of the railroad and in its relations with employees.

The accompanying table gives the disposition of these matters and shows the number of cases taken up with officers below superintendents, with superintendents, general superintendents and general managers; the number of cases adjusted or compromised in favor of the employees with these various officers; the number of cases withdrawn as having no merit, etc.; the number of cases in which decisions were appealed to the next higher officers; and the number of cases received and disposed of by the reviewing committees.

The reviewing committees in the case of each class of employees concerned are composed of an equal number of representatives of the employees and the management. All members of these committees have equal voting power, the employee members being selected by the employees themselves. Two-thirds vote of the committee is necessary to decide any question submitted to the committee and the chairmanship alternates between an employee member and a management member.

Summary of Cases Handled Under Plan of Employee Representation

The total number of cases taken up with individual officers, from those below the grade of superintendent on up through the general managers, was 5,201.

Of this number, 2,553, or a little more than 49 per cent of the total number of cases, were adjusted or compromised in favor of the employees in conference between the employee representatives and the respective officers, without appeal and therefore without the necessity of being referred to the reviewing committees.

Appeals from the decisions reached in conference between the officers and employee representatives were taken in 1,239 cases, or about 24 per cent of the cases handled. In 1,409 cases, or about 27 per cent of the total, the matter was withdrawn as having no merit or for other reasons. In less than two per cent of the cases taken up on behalf of the employees was it necessary to take an appeal to the reviewing committees, a mutually satisfactory settlement having been reached with the local officials or next higher authorities in all other cases.

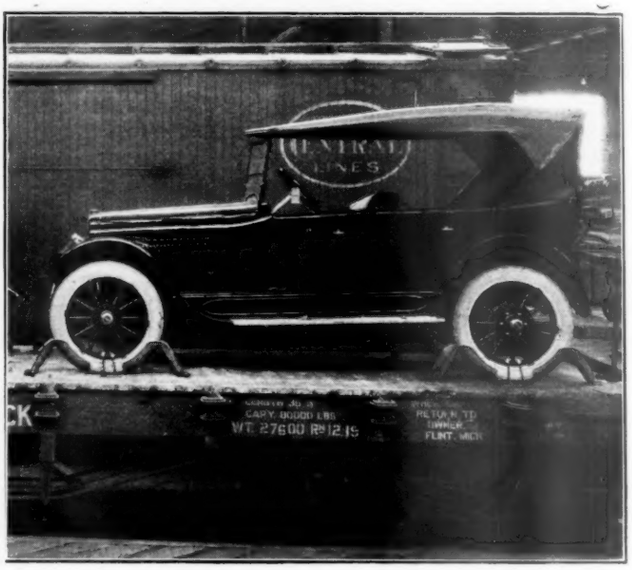
The actual number of cases received by the reviewing committees in the first six months of the year and disposed of, according to records covering this period, was 98. Of this number, 49 were decided in favor of the management, 20 in favor of the employees, and 29 were withdrawn after reaching the committees.

The record of cases handled to conclusion in conferences between the various officers and the employee representatives down the line, is regarded by the management as a tribute to both the employees and the officers. It shows conclusively a manifest spirit of fair play and a willingness on the part of employees and officers to co-operate in reaching an amicable settlement of matters in dispute.

THE NEW JERSEY ASSOCIATION, said to represent 4,000 New Jersey students attending New York University, has petitioned the Interstate Commerce Commission for a lower railroad fare for New Jersey students attending school in New York. The petition says that there are 10,000 such students—men and women, and that the preferential rate would save them $500,000 a year.

Gier's Blocks for Fastening Automobiles on Cars

A NUMBER OF manufacturers of automobiles have reduced loading and unloading costs, and at the same time have made their cars even more secure from possible damage while in transit by using Gier blocks, which are returned by the consignee and used over again. In a severe test made in the Buick Company's yards, the draft timber and the whole end of one box car were broken by the terrific impact, but the Gier blocks held the automobiles securely. These blocks are 10½ in. high and stamped to fit the tread



Gier's Automobile Loading Blocks

of the wheel, from No. 10 steel. They weigh 10 lb. each and can be nested and returned to the factory in bundles.

One shipper reports that the blocks average three trips in two months at a return cost of 40 cents a set of eight. Each is stamped with the owner's name. It is estimated that the blocks earn their cost in five trips. They cause the minimum damage to freight car floors, as an easily removable double-head nail is used.

P. & A. Photo

C. & N. W. Carmen Again at Work

Sir Henry Thornton to Head Canadian National

American Trained General Manager of English Road Chosen for Important and Difficult Post

By J. L. Payne

ALL SUSPENSE with respect to the appointment of a new board to take charge of the Canadian National Railways has been ended by positive action on the part of the government. No one may say that impulsiveness had been shown. It was in 1918 that the system was erected, following the collapse of the Canadian Northern and Grand Trunk Pacific, and early in the following year legislation was passed providing for a board of directors. Nothing was done in 1919, however, nor in 1920 and 1921.

Matters were about at their worst when the King government came into power in December last. Popular alarm was then acute. There was a general and urgent demand, on the part of press and people, that steps should be taken to put in a strong, capable and courageous board. The taking over of the Grand Trunk in 1921, adding nearly 5,000 miles to the 17,000 odd which had composed the national group, made immediate action imperative. But it was not until 10 months later that this highly necessary step was taken. In this, depending on the angle of view, some will see the looseness and irresponsibility which usually attach to public ownership, while others will identify proper prudence and deliberation in the discharge of an important duty. It is sufficient to say that, in the meantime, growing impatience had been shown on the part of the press of the country, voicing public sentiment.

(Photo from Co-operative Press)

Sir Henry W. Thornton

Let no one, however, from whatever point of view the matter may be scanned, fancy that the government was confronted by a light task. Without the slightest prejudice, let it be said that the results of public ownership had positively appalled the Canadian people. As has been said, the operating deficits jumped by many millions annually. Worse still, advances from the public treasury, to cover losses and put the new system into proper working shape, went up by hundreds of millions. Reference to that aspect will be made further along. There was genuine and universal fear that if these losses were not stopped the country would find its credit impaired—would, indeed, be confronted by staggering conditions.

There was unquestionably one cause in particular for this long delay. A man of outstanding capacity was required to head the new board—a man whose record and qualifications would command public confidence—and it was found that such a man was hard to get. The United States was combed to find him. The question of compensation was not an impediment; for the government could fix the salary of the man who measured up to the specifications at any amount. There was no limit. One after another men who had earned a name in the American railway world were called to Ottawa in this grand quest. Those who would have been acceptable backed away when they looked at the task before them and took cognizance of the conditions under which they would be expected to work. Some wanted a freer hand than could be assured. Others who would have accepted the post were found lacking in qualifications regarded as vital. Thus the months went by. The right man could not be found, or when found, shrank from the great responsibilities involved.

At last a choice has been made, and a name hitherto unmentioned in the canvass has been introduced to the Canadian people—the name of Sir Henry Worth Thornton. He is an American by way of England. The new general manager and chairman of the board was born at Logansport, Ind., in November, 1871. He is therefore 51 years of age. He was graduated from the University of Pennsylvania in 1894 as a civil engineer, with the degree of bachelor of science. His first job was as draftsman in the offices of the Pennsylvania Railroad, where he seems to have gained recognition; for, after rising from one position to another in the engineering department, he was in 1911 made general superintendent of the Long Island Railroad, a subsidiary of the road with which he had been engaged for 17 years. Here he found scope for executive judgment, chiefly in connection with the terminal problems of the Pennsylvania in New York City and the organization of the electrical train service of the Long Island Railroad. At one time he was chosen by L. F. Loree, then general manager of the Pennsylvania, to develop a students' course in transportation, because of his experience in nearly all departments of the Pennsylvania System, and he appears to have made good.

While it does not appropriately form any part of this hasty sketch of facts and events, it may be worth while, in passing, to observe what happened in the rise and progress of this distinguished railroader, and why. He had a sound grounding. He started at the bottom of the ladder. He no doubt had great natural gifts; for in this rugged and practical world a pint measure can never be made to hold a quart. He had the capacity for big things; but that would not have carried him to high place if he had not got into his proper orbit. He found the orbit in the Pennsylvania system and quite obviously made the best of it. That gives us a clue to the character of the man. His was not a pyrotechnic advancement. He came to his full stature by successive steps, appropriating knowledge as his experience

widened. The point which needs to be emphasized is that he was qualified for a large orbit and he found it.

Achievements in England

In April, 1914, he was offered and accepted the post of general manager of the Great Eastern Railway in England. He got it on his merits. A few months later the world war broke out, and strenuous times came to the heads of the large British railways. The Great Eastern, one of the most important of the English roads, with strong steamship connections, became one of the leading lines of military communication. Mr. Thornton was made a member of the executive committee of general managers which, under the control of government, administered all the railways of the United Kingdom. In 1916 he was appointed director of inland water communication, with functions extending to France, Egypt and Mesopotamia. Early in 1917 he was sent to Paris as assistant director general of railways, and became further identified with military operations. From the rank of colonel he passed up to be brigadier general. Finally, he had charge of army transportation on the continent with the rank of major general.

While all this was happening, Henry Thornton remained an American citizen. Having regard to the more or less rigid rules of English life in such matters, this would seem anomalous. It was. But great events were transpiring and big men were needed to cope with them. His nationality was subordinate to the service he was prepared to give. That alone counted. It was not until March, 1919, that he was naturalized as a British subject. In May of that year he was, for high services to the state, gazetted Knight Commander of the Order of the British Empire, and became Sir Henry Thorton. He is also Commander of the Legion of Honor of France, an officer of the Order of Leopold of the Belgians, and holder of the Distinguished Service Medal conferred by the American government.

New Task One of Greatest in Railway World

These brilliant titles and honors grow rather dim when brought into contrast with the glaring fact that Sir Henry Thornton has now been chosen for one of the most gigantic tasks ever assigned to a man in the history of transportation by rail. Canada's venture into public ownership has created a problem graver than that which has confronted any country. It is no mere figure of speech, or play on words, to say that if he solves it he will save a nation. It is a solemn truth, although it is only clearly recognized by those who have studied the facts and grasped their real significance. He has to turn an annual loss of more than $100,000,000 into at least a balancing of accounts. His pathway is at this moment beset by obstacles. One of them is fundamental and relates to the act under which he must operate. Let us look at its main features—for Americans will be deeply interested in what may happen with respect to Canada's national railways as Sir Henry proceeds with his administration.

The governor in council may nominate such persons as may be deemed expedient, not less than five, nor more than fifteen, to be directors of the company hereby incorporated, and upon such nomination being made the persons so nominated, and their successors, and such other persons as may from time to time be nominated by the governor in council as directors, shall be and are hereby incorporated as a Company, under the name of "Canadian National Railway Company," hereinafter called "the Company." No stock ownership shall be necessary to qualify a director.

The directors shall hold office from one annual meeting to another or until their successors are appointed, unless removed by the governor in council for cause. Upon any vacancy occurring the governor in council may fill the vacancy by the appointment of a successor. The continuance of a vacancy or vacancies shall not impair the powers of the board of directors. The annual meeting shall be held upon the second Thursday in April in each year, or on such other date as the directors may from time to time determine.

It will be seen that these clauses place absolute power as respects the board in the hands of the government, and government control of course means political control. "Unless removed by the governor in council for cause" has enormous significance. It is clear that at any time the official life of a director may be brought to an end. It is not for a moment suggested that this power of life or death over every member of the board would be used arbitrarily or contrary to public interests. Popular judgment, always active and articulate in Canada, would not permit the assertion of reckless political control; but we must all see that the power is there, and, while it is there, partisan expediency may compel—as it has so often done in the past—action which could not be defended on higher grounds.

Government Earnestly Striving to Solve Railway Problem

The King government inherited this railway problem, and, the writer believes, is sincerely trying to solve it. The announcement of the personnel of the new board, with such a commanding personality as Sir Henry Thornton at its head, has been received by the Canadian people with unqualified approval. The general judgment is that a strong board has been chosen. There is a universal disposition to give the management every possible latitude in the tremendous task which it has assumed; but no one who is familiar with the main features of that task would feel like minimizing it. One of these features is the great length of parallel mileage, both in the East and the West, but particularly in the West. This grew out of two political roads being built through the same territory at the same time, which must always be regarded as a folly that could not have been carried out under other conditions.

Everything would now seem to depend on whether or not Sir Henry Thornton and his associates are given a free hand. While the power to control is still vested in the government under the Act of 1919, there is nothing whatever to prevent the substitution of another measure giving as complete independence to the new board as the Railway Commission of Australia and the Railway Commission of Canada enjoy. Political considerations alone would interpose an obstacle. Public sentiment would probably approve; but it happens that the Progressives, chiefly from the Western provinces, hold the balance of power in Parliament, and they are strongly in favor of public ownership. It is in their territory, moreover, that the parallel mileage, to which allusion has just been made, is situated. The question of vested rights comes in on the part of small communities located along this double right of way, and to that sort of feeling politicians are invariably sensitive. These people would resist being changed from their present main line status to branch line rank. They like to see the express trains go by, notwithstanding the fact that they contribute very little traffic to them, which is another way of saying that the human factor here holds a large place.

Various Interests—Including Organized Labor—Represented on Board

Sir Henry Thornton will have around him a group of admittedly strong men. They have apparently been chosen on their merits, and for that reason are acceptable to the Canadian people—or appear to be at this moment. They are:

John H. Sinclair, of New Glasgow, Nova Scotia. Mr. Sinclair was for many years a member of Parliament, and is the only man on the new board who could be suspected of holding place for political reasons; but he is really a good choice. He is conservative, cautious and competent. He brings no railway experience to his task; but his strong and slow-moving judgment will be valuable. His integrity is unimpeachable.

Richard P. Gough, of Montreal. Mr. Gough is a man

of large business experience, and in that regard is neither stronger nor weaker than scores of others who might have been chosen. He is what the country will regard as a fair representative of Canada's men of commerce.

James Stewart, of Winnipeg. He is probably the choice of the Progressives. He was for some time the head of the Canada Wheat Board, and is at the present time general manager of a large milling company. He is held in universal esteem as a man of capacity.

Ernest R. Decary, of Montreal. He was for some time head of the Montreal Civic Commission, and made good. In a large sense he might be regarded as the representative of French Canadian interests on the board.

Frederick G. Dawson, of Prince Rupert, British Columbia. Mr. Dawson is spoken of very highly by those who know him; but he starts as a stranger to the people of central and eastern Canada. He is a wholesale merchant.

Tom Moore, nominally of Ottawa. Mr. Moore is head of the labor unions in Canada, an Englishman by birth, who has made a very favorable impression for his moderation and breadth of view. He will not be a cipher at the meetings of the board; but he must be clearly identified as the special representative of labor.

Graham A. Bell, C. M. G., of Ottawa. From a clerkship Mr. Bell has risen in the Department of Railways and Canals to be deputy minister. Of all the members of the board, Mr. Bell is the only man, save the general manager and Mr. Ruel, who has had any railway experience whatever. He was never connected with any of the operating departments, but he is a master of all the financial details relating to the Canadian National system. He was very closely associated with the old Canadian Northern management, and he bears an untarnished name. For the present he will continue also to serve as deputy minister, although it is generally believed that it would be in the public interest if he gave his whole time to the railway proposition.

Gerard G. Ruel, of Toronto. Mr. Ruel, as a lawyer, has had long experience in the capacity of railway solicitor, chiefly for the old Canadian Northern; but his work heretofore has been somewhat in the background. For that reason his being given a place on the new board has occasioned some surprise. He will, however, be a useful member in matters of detail and law.

That then, is the composition of the board, for which the country has waited so long with rising impatience and discouragement. Before it lies a task of stupendous proportions. At the bottom of the broad problem, as has been said, lies the fact of a very large surplus mileage, consisting of trackage running almost side by side over thousands of miles of territory. Can political interests stand the strain of dealing with that situation in a businesslike spirit? That is the supreme question which the course of events alone will answer.

Road's Financial Condition Has Improved, But Is Still Grave

It would be quite impossible for any uninformed reader to gage the real magnitude of the problem awaiting solution in Canada. During the current year drooping hopes have been revived by the monthly announcements of operating results on the government lines. If all continues to go well until the end of the current year, the deficit on operating account may be cut down to about $10,000,000; but, while some of that betterment is on a bookkeeping basis, the fixed charges have grown at such a rate as to practically absorb all the gain on operating account. These fixed charges present one of the most difficult problems with which Sir Henry will have to deal. They were large when the Canadian Northern and Grand Trunk Pacific were taken over. They were increased when the Grand Trunk was absorbed into the public railway system. The swelling has come chiefly, however, from the fact that since public ownership was set up hundreds of millions have been taken out of the Dominion treasury to meet the needs of the system. The actual deficit as revealed by standard railway accounting amounts now to about $100,000,000 per annum, quite apart from operating loss.

The advances made from the public treasury totaled $112,632,154 for the fiscal year ended March 31 last, without taking any account whatever of interest and other charges attaching to five thousand miles of line being operated at a loss, but which are taken care of under the head of the public debt and are therefore not identifiable.

Advances from Public Treasury

The facts in that regard are so enlightening that it is distinctly worth while to give them in detail. They are as follows:

Canadian Northern	$45,688,142
Grand Trunk	56,442,020
Grand Trunk Pacific	10,501,992
Total	$112,632,154

That was the amount of the direct call on the public treasury for these three roads. A very large amount, certainly not less than $30,000,000, would have to be added for the National Transcontinental, the Intercolonial, the Prince Edward Island and 500 miles of branch lines. The facts are not available at the moment. But that is not all. During the year, securities were issued on account of the Grand Trunk for $25,000,000 and an equal amount for the Canadian Northern, both bearing government guarantees; so that the final total would be close up to $200,000,000, if not well beyond that figure. One of the difficulties in the way of getting precise and accurate information is an archaic system of accounting, which covers up an enormous amount of capital charges under the rather indefinite head of the public debt.

Capital outlay, without reference to the $100,000,000 required annually to cover the ordinary deficit, will unavoidably be large as time proceeds. The government, for example, must provide for a high proportion of the transportation needs of the West as the area of settlement is extended. Equipment requirements will be heavy and constant. In short, the money for all purposes must come out of the public treasury, with a corresponding addition to fixed charges. Yet there is the chance that earnings may exceed operating cost, and that as traffic develops a growing credit balance may help to meet the burden arising out of capital liability. That chance will be improved if efficiency and sound administration succeed to the inefficiency and waste which have protruded from every angle of public ownership in Canada. As the retiring general manager said recently, "the Canadian National can be made an asset if politics are excluded."

Notwithstanding the grave burden which rests on the people of Canada as the result of railway nationalization, there is a general feeling that public ownership should be given a fair chance. Let it be clearly understood, however, that this disposition to adopt a passive attitude does not rest on definite popular approval of the underlying principle. It rests solely on the conviction that the situation is so bad nothing else whatever can be done. The people of Canada, neither directly nor indirectly, ever approved of the principle of public ownership. The position of matters in Canada will be quite misunderstood unless that fact is clearly recognized. The people were not consulted, and no one may say how they feel about the abstract proposition. What they realize is that these costly properties are on their hands, and that all they can do is to make the best of them. They are therefore disposed to give the new board their loyal support and on their own part spend much time in fasting and prayer. Their taxes will not permit them to forget their obligations.

Suggestions for Greater Efficiency and Economy

By Franklin Snow

THE LIMITED, running 45 minutes late, was nearing New York. On the next track, a short distance back, was the local suburban train. Ten minutes further delay for the express would mean a refund of extra fare amounting to $1.20 each to over 100 passengers. The trains approached the point where one or the other must take the only remaining inbound track. The recognized principles of dispatching, that a delayed train shall be given every opportunity to make up lost time, and that a through train shall ordinarily be given precedence over a local, even though they may both be of the same actual class, would indicate that the Limited should be given the track. Nevertheless, on No. 2 track appeared a home signal, while on No. 4 track the local received a proceed signal to take the cross-over and precede the Limited into the terminal, thus jeopardizing the chances of the express to arrive less than 55 minutes late (after which the refund for one hour's extra fare must be paid).

That this inefficient dispatching occurred with frequency can be attested to by the writer, who observed this trick as often as once a week over a period of several months. It is obvious that the dispatcher, and indirectly the officers who later reviewed his train-sheet, made a direct error in judgment, or else were inexcusably ignorant of the fact that a chance was being taken in holding a train running so closely on the time when a refund of extra fare would be necessary. The $150 or so, in this case, is a trivial sum, when considered as a portion of a trunk line's monthly revenue, but the indifference with which its loss is evidently regarded indicates a certain laxity in supervision which may be considered a fair criterion of much greater extravagances elsewhere.

In direct contrast to this incident may be cited another similar case which happened several years ago, when railroad operating ratios were below 70 per cent and when there was less absolute necessity of watching every penny. The Knickerbocker Limited, from Boston to New York, left New Haven 40 minutes behind schedule. Considerable "joshing" ensued in the observation smoker between passengers and conductor, the former inquiring as to whether or not refund receipts were ready for distribution. The conductor, with some pride, assured the passengers that they would not need them *that* trip, and such proved to be the case, a particularly fast run being made which enabled the train to pull into the Grand Central just 29 minutes late, or a minute under the time after which refunds of extra fare were necessitated.

Innumerable instances coming to the attention of observant passengers or shippers make it apparent that, despite the much greater necessity for economy in every direction, there is much room for increase in efficiency. Reliable statistics point out the fact that little lasting improvement has been made over 1919 operating standards, despite the temporary spurt in 1920.

The following table, showing comparative statistics of the most interesting and valuable features for the month of July, indicate a discouraging gain in efficiency effected by private management. In 1919 the Railroad Administration was operating the roads under normal conditions, the war traffic having ceased, but being replaced by heavy commercial traffic. In 1920 the railroads were endeavoring to reach the highest possible point of efficiency, with a 30-30 record on car-loading and car-mileage (which was never attained), against the time when the government guarantee would expire, while in 1921 the figures reflect, to an extent, the cessation of activities in shops, to which is attributable the increase in percentage of bad-order cars.

	1919	1920	1921
Per cent of cars loaded	67.9	71.1	63.6
Average number tons per car mile	27.9	28.2	27.8
Average car-miles per car-day	24.1	24.4	21.3
Net ton-miles per car-day	455	490	375
Average speed per freight-train-mile	10.8	10.8	11.9
Gross train miles per freight-train-mile	1,571	1,470	1,472
Net ton-miles per freight-train-mile	757	725	674
Per cent of net to gross-ton-miles	48	49	46
Cost per freight-train-mile	$1.54	$1.87	$1.88
Average per cent locomotives unserviceable	27.2	24.2	23.3
Average per cent freight cars unserviceable	8.7	6.6	15.9

The above statistics, picked at random, represent those given greatest consideration by operating officials, out of the mass of reports which the railroads compile (either voluntarily or by order of the I. C. C.). No extended analysis is offered, nor is one necessary. The 1921 figures show no appreciable improvement over those in 1919, while in some instances they show a decided falling off in efficiency. The spurt of 1920 was short-lived. Car miles are now averaging 21 miles per day, while loading remains fixed at approximately 28 tons per car. Despite the present great surplusage of freight cars, it is indeed a poor policy to permit car-mileage to fall off as it has. When traffic again revives it will take months to get an organization keyed up to the point where it was when the high pinnacle of 28 miles was touched.

This record, once attained, should have been used as a spur to even greater accomplishment in this direction. When there is an ample supply of cars for all requirements, there is, of course, no great incentive to expedite movement of cars on line in order to make them available for another load. Nevertheless, while it is impossible to prepare figures to verify the contention, it is obvious that a car moving only 20 miles per day is costing more to handle than one which is sliding along at a 30-mile per day average, even if only in additional per diem charges. However, some justification of decreased car-mileage may be found in the increased average train speed.

Gross tonnage per train decreased 100 tons to 1,472, but this is really an economy, as too high a tonnage record has frequently meant enormously increased transportation expenses in overtime wages, etc. As the per cent of net gross decreased from 48 to 46, we must, however, consider this as a failure to maintain the highest efficiency of transportation.

Increased cost per train-mile is, of course, directly attributable to wages, while high percentage of unserviceable cars, is, as previously pointed out, due to the fact that the roads have permitted repair work to wait until it could be performed under the lowered wage-scale.

Many concrete examples of extravagance and needless expense are at hand. The sight of a business car, trailing an already over-loaded passenger train is a familiar one to travelers. Transportation experts tell us that it costs 30 cents a mile to haul a heavy steel car. Therefore, let us assume that an official going from New York to Chicago, something under 1,000 miles, taking his car with him, is costing his company approximately $600 for the round trip. As a large part of the run is made at night, "inspection" is a poor excuse for the necessity of a business car. While many officials take such opportunities to get rid of accumulated correspondence, we might remark that even a railroad president could dictate for one evening in a Pullman drawing-room, in view of the economy thus effected. However, the height of the ridiculous is reached when, as happened recently on a great western line, two cars were added to a heavy transcontinental train (necessitating an extra locomotive) to carry certain economically-inclined officials to a fuel-conservation meeting.

In justice to railroad officials though, be it said that the use of official cars has been greatly curtailed recently, and the sight of such a car on a foreign line today is unusual, a tacit understanding having been reached, doubtless, that cars shall not be used off the home roads except in necessity.

Another matter, which is frequently censured editorially by certain periodicals as costing the railroads many thousands of dollars annually is that of free transportation, to which officials, employees, and their families are entitled. Too much has already been said and written on this subject to warrant any further comment on the right or wrong of the question, although the writer is inclined to the belief that passes, judiciously granted, are a direct benefit to the railroads, insofar as the employees take pleasure and pride in obtaining such passes. The system of granting free transportation differs on every road, although the basic principle is length of service, or meritorious service with the company.

Thus, to obtain an annual pass represents something of an achievement and increases the prestige of the recipient among his fellows, thereby increasing his loyalty to the company which rewards his faithful service. Further, an official can obtain a pretty good line on the interest his men take in their road by the pass requests they make; *i.e.*, an employee whose idea of free transportation is that it gives him an opportunity to see what his road looks like and with this knowledge become of greater value to the company, is the man worth developing, while the man who constantly requests passes to a nearby pleasure resort or city thereby indicates his indifference to the opportunity of making his holiday trips of benefit either to the company, or himself.

However, looking at the entire question of free transportation in a broad spirit, there is no reason why railroad men should not receive gratis, or at half-rate (as is the case of some foreign employees' passes), the product of their business, namely transportation, just as freely as those in other industries benefit by gifts, discounts, and wholesale prices in their own line. For instance, it is the custom for hotel men to decline payment of bills incurred by other hotel managers who happen to stop at their hostelry.

Unfortunately, though, an extravagance has crept into the distribution of annual passes by the use of the "complimentary list." This burdensome practice has become so fastened on the railroads, that toward the close of each year all departments of the larger roads prepare, and submit to their pass bureaus, a list of officials and their families, who, in the opinion of the pass-requesting officer, should receive annual transportation over his line. The original idea was to include primarily those officials of foreign roads who might be in a position to divert considerable traffic to a road presenting them with passes. The lists have now assumed such proportions, however, that personal friends of officials, past and present, comprise a large part of the list, together with widows of former officers of various roads, some living, some dead; children of officials, many of whom have long-since become self-supporting, or married, and other similar incongruities.

When the amount of money spent both in stationery and clerical labor in this annual procedure is considered in its entirety, no imagination is necessary to point out one huge and useless extravagance. How much better it would be if an agreement could be made whereby passes would only be issued upon request of an official of a foreign road, who, presumably, would only request such transportation for himself and family as he might reasonably expect to use during the ensuing year. This would also, to some extent, preclude the possibility of passes falling into improper hands.

With the present great number of outstanding annual passes, many conductors glance at them only in a cursory manner, especially on the suburban trains, which many employees use for commuting to and from their places of employment. So lax have conductors become that recently it was discovered that a former employee of a railroad was travelling to work on a Railroad Y. M. C. A. card, which bore a distant resemblance to the annual pass of the company. The conductor on whose train the man rode had doubtless become so familiar with this person's face as being a pass-holder, that he ceased to even glance at the pass-case which was shown daily, the man covering a certain part of it with his hand, and in this way the company was hood-winked for several months, before the fraud was discovered.

However, these occasional instances of mis-use of passes should not be considered as being arguments against the privilege itself, which is a thoroughly and properly appreciated one by the great mass of railroad men. The only condemnation of it is in the extravagances which have crept into the system of distribution.

When Headlight Meets Headlight

READERS INTERESTED in the train accident record will recall the account of a collision of passenger trains at Plains, Kansas, on April 19, 1922, about 2 a. m. (reported in the *Railway Age* of June 10) in which each of the two enginemen, running at full speed toward each other on single track, remained oblivious to his danger until within a very short distance of the other train; though both trains carried bright electric headlights and the line of road was straight and level and the weather clear. Both enginemen were killed.

Since the publication of that report there has been a considerable amount of discussion of the question how such a disastrous error could be made; and we have made inquiry of a number of operating officers and locomotive runners with a view to comparing representative opinions. The government's investigation has afforded no light on the two enginemen's probable mental processes; and, the enginemen themselves being silent in death, all that can now be said is in a measure speculative; nevertheless an examination of the general headlight question may be instructive. Can the engineman of a moving passenger train be so dazzled, as he faces an electric headlight a half-mile away, that he will think it is several miles away? And is there no remedy for such a risky condition? A collision similar to that at Plains occurred at Seneca, Mich., on November 27, 1901, causing the death of 20 or more passengers.

Were the Enginemen Asleep?

A decided majority of careful men who have examined the record of this case hold that with competent and experienced enginemen, awake, the collision would not have occurred. Two superintendents and one engineman conclude, from the record, that unquestionably both of these men must have been asleep.

A trainmaster (formerly an engineman) and two superintendents feel sure that each engineman, having assumed, when he started out on that seven-mile run, that the opposing train was on the siding at the remote station, and having been assured that he himself had the undoubted right of road to that station, continued to rest in that assumption, giving little or no thought to the headlight. This line of thought implies either that (1) the near approach of the opposing headlight was not perceptible or (2) that its presence on the main track (instead of, as assumed, on the station side track) did not present so different an aspect as to remind the observer that it was not on the siding, or (3) that the engineman was not keeping a good lookout.

In all this both enginemen are to be considered, each by himself, each having encountered conditions which presumably were exactly like those encountered by the other.

This view, that both enginemen had full confidence that their right to the road was absolute, is strongly emphasized by a committee which was convened by Road Foreman of Engines E. W. Elleman, of the Hocking Valley, to consider this case. It enforces the grave truth that a mistake of dispatcher or operator in giving right to road, which was

the primary cause of this collision, must always be considered as irreparable.

Explicit Rules Needed

Considering the single question, what to do about the headlight, the first thought of most officers is that the rules ought to cover the point very explicitly. A rule which has been approved by the A. R. A. committee on operation (on January 9, 1922), requires electric lights to be dimmed "when standing." An officer of the Baltimore & Ohio states that substantially this requirement is included in the rule of his road; and a rule of this general character is in effect practically everywhere; but to what degree uniformity of wording and of practice have been agreed upon, in any territory, is a point on which further light is needed.

A traveling engineer of the Illinois Central suggests that the proper rule should read:

(a) When trains are standing on siding, clear of main track, to meet an opposing train, the headlight is to be concealed.

(b) When trains are standing on main track, clear of siding to be entered by opposing train, the headlight is to be dimmed.

(c) When trains are standing on main line, or on siding not clear of opposing train, or when running, the headlight is to be kept burning brightly.

An officer of the Southern Railway sends the substance of a letter, concerning this collision, which was received by him from an engineman of 30 years' experience (on a line with tangents many miles long). The following paragraphs from this letter are intended, evidently, by the writer, as a summary of his views as to both cause and remedy:

1. Brain fag. Loss of memory. A man sees with his brain, his eyes are only a medium for transmitting.

2. Did not err as to distance; they had no knowledge of their surroundings; caused by temporary mental aberration.

3. The difference between a strong electric headlight a half mile away and one three to six miles away is so marked, in clear weather, that no man in possession of his mental faculties could fail to note the difference.

4. To decide distances in a case like this is not difficult, assuming the engineman knows the road.

5. See that enginemen are thoroughly familiar with the physical characteristics of the road.

6. Try to see that the morals of enginemen are of the highest type and that they have ample rest before reporting for duty.

7. A lack of concentration, failure to keep one's mind on the job, is responsible for most accidents.

8. Preach Precaution, Prudence and Morality; this results in safety of operation.

Lights Should Be Focused Downward

Those correspondents who emphasize the difficulty of estimating the distance of an approaching electric headlight —some of them declaring that no one can trust himself to do it with certainty—make prominent the importance of correct focusing of every light. The light should be focused downward, so as to illuminate the rails several hundred yards ahead, but not farther. A lamp improperly focused may light up the rails for many miles ahead. On an undulating grade this difficulty is, of course, inescapable; but runners well acquainted with the road can, of course, make due allowance in such situations. It is suggested that roundhouse foremen should be very particular in requiring proper focusing, and that individual enginemen should be forbidden to make any change in the adjustment. An officer of the Great Northern advises that some of the enginemen on his road propose the dimming of headlights about two-thirds, when opposing trains are nearing each other. This would aid both trains in locating themselves, and each other, while yet affording a light strong enough to drive with safety.

The two following interesting paragraphs are from an officer of the Florida East Coast:

"Shut off your own headlight and when the rails show a glint of light the approaching train is approximately one mile away. We have observed headlights on our road, over the Keys, one-half hour before the train would reach you. It was customary to drive motor cars until the rails showed a glint of light, and then, without hurrying, the motor car could be removed with safety. However, this required a certain knowledge of conditions, and strict attention to the business in hand.

"All enginemen are not alike in this respect. It may or may not be a matter of record, but collisions have in fact been averted a number of times by the headlights burning, when lap-orders were given or orders overlooked. We have had one case of two trains colliding on straight track with headlights burning. The negro fireman, who was experienced, called the engineman's attention to the opposing headlight, and then turned his own headlight out to determine the distance; but the engineer paid no attention to the warning. One train had a meet order, the other had nothing The fact that the headlight showed up called for action."

A Succinct Summary

An operating officer in Louisiana interviewed some of his older enginemen and gives the following comprehensive comment and review:

"Without exception all of the locomotive engineers that I have talked with on the subject insist that this collision should not and would not have occurred under the conditions as stated, had the engineers of both of the trains been awake and alert and fully masters of themselves at the time.

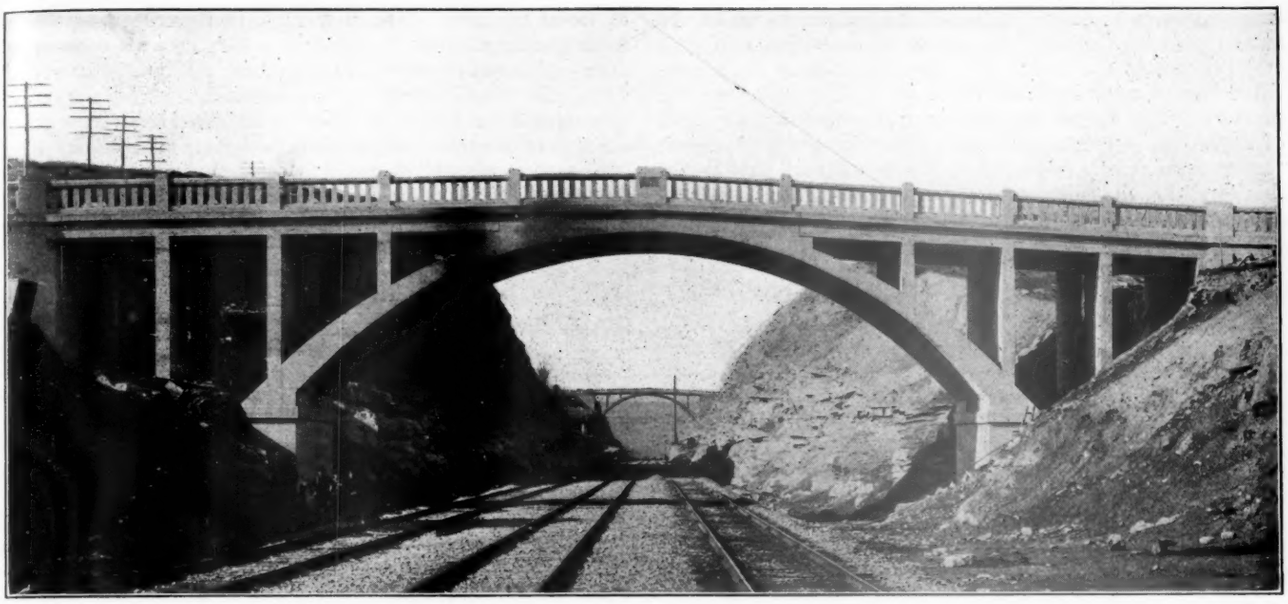
"Almost without exception our engineers called attention to similar experiences of their own. They say that when an electric headlight gets within a range of something like a mile it is very easy to locate it, one of the ways being that the line of rails will show up very plainly; while at a distance of two miles or more, about all that can be seen is a light similar to a ball of fire. After the light gets closer, and particularly when within about a mile, there is a heavy glare which increases and is so strong that it shows up the line of rails brightly. In short, the verdict which I obtained from interviewing these men, at least a dozen in number, is that under the conditions named the engineers, one or both of them, must be held finally responsible.

"I have ridden engines at night a good deal during my years as a transportation officer and the replies given me by these engineers as above are in line with my experience.

"It would hardly seem that both of these engineers could have been asleep at the same time; yet that could be possible. It could be possible also that one of them was asleep and the other carelessly allowed himself to take his eye off the rail for a minute or two at the very time he should have been keeping the sharpest lookout; and, as we all know, enginemen will sometimes do that very thing.

"What can be done to educate or regulate enginemen in connection with such a situation? The solution of the problem lies in selecting for the position of engineman only those who have been proved to be safe and sane men. Enginemen are not all alike. It has been my experience on the three different roads that I have served that we have enginemen who are known by the rank and file to be essentially safe men, while there are others who are generally recognized to be, if not unsafe, not as safe as they should be. And there is what we may call the middle class.

"I think we may safely conclude that this collision could not have occurred under the circumstances, had the enginemen in charge of both trains been what railroad men term essentially safe men."



The Gilmore Arch—An Overhead Highway Bridge

Development of Concrete in Railway Construction*

A Review of the Steps in the Adoption of This Material on the Delaware, Lackawanna & Western

By M. Hirschthal
Concrete Engineer, Delaware, Lackawanna & Western

SOMEWHAT MORE than twenty years ago, the Delaware, Lackawanna & Western embarked on a departure from the then current railroad construction practice in the east, by adopting concrete as the material for bridge abutments, retaining walls, etc., for the Newark, N. J., grade

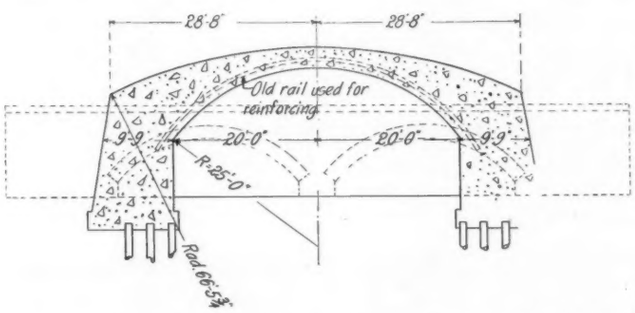


Fig. 1—Forty-foot Arch Over Beaver Brook, Bridgeville

crossing elimination work. Railroad engineers then, as now, enjoyed the reputation of being the most conservative of any in the practice of engineering and this adoption of concrete was considered a bold step forward. Contrary to the normal direction of the progress of civilization, which has been from the east toward the west, the progress in the use of concrete was from the west toward the east as concrete appeared in the construction work of the western railroads several years before it was employed by the eastern lines.

Prior to the advent of W. K. McFarlin as chief engineer of the Lackawanna just before 1900, concrete was not used along the line of the railroad for any purpose other than back-filling or other equally unimportant work not subject to stresses. The remarkable growth of the use of this "new" construction material, both plain and reinforced, in the 20 succeeding years, is evidenced by the monumental structures of concrete all along the line from the lowly drain pipe to the majestic Tunkhannock viaduct. The evolution of the design and construction of concrete structures from the humble beginning became a very interesting process,—at first slow and laborious,—increasing in its momentum and finally becoming almost all-embracing in its scope.

Evolution is defined by Herbert Spencer as a development from the simple to the complex, and the evolution of the use of concrete as a structural material is no exception,—it is the development from the simple gravity sections with pressure lines limited to the middle third of the plane of section, resulting in simple compression throughout, to the highly complex four-way type of reinforcement, and rigid frame structures designed to take stresses of all types and in all directions, complicated by all manner of combinations and conditions of loading pertaining to any particular case.

The following description is an attempt to outline this growth and illustrates the wide usage that concrete enjoys in the construction work of the Lackawanna. The description necessarily partakes somewhat of the nature of a historical sketch due to the fact that each new structure has represented a step forward in the development of the use of concrete for purposes requiring more complicated design.

The Early Uses of Concrete

As already mentioned above, the first use of concrete along the line, and the only use of it for some years, was in the

* This is the first of three articles. The other two will appear in early issues.

construction of retaining walls and bridge abutments of the mass type with the standard section then obtaining in general practice in the design of masonry retaining walls particularly for retaining railroad embankments, keeping the pressure within the middle third to avoid tension at any part of the section. The cry in railroad practice has always been "make them heavy enough," it being assumed that under this condition the soil pressure would take care of itself.

The next use of concrete was in the construction of "rail-

of stone masonry. The new arch is segmental, of 40-ft. span length, with 10 ft. rise and a 3-ft. crown thickness to carry a fill of over 40 ft., necessitating a length of barrel of 123½ ft., supported on pile foundations. The section is what might be termed a "Trautwine" section, having very heavy haunches and but slightly battering abutments. The ring was reinforced by rails to conform to the intrados of the arch, (Fig. 1).

It was also in 1903 that the Keyser Valley and Kingsland

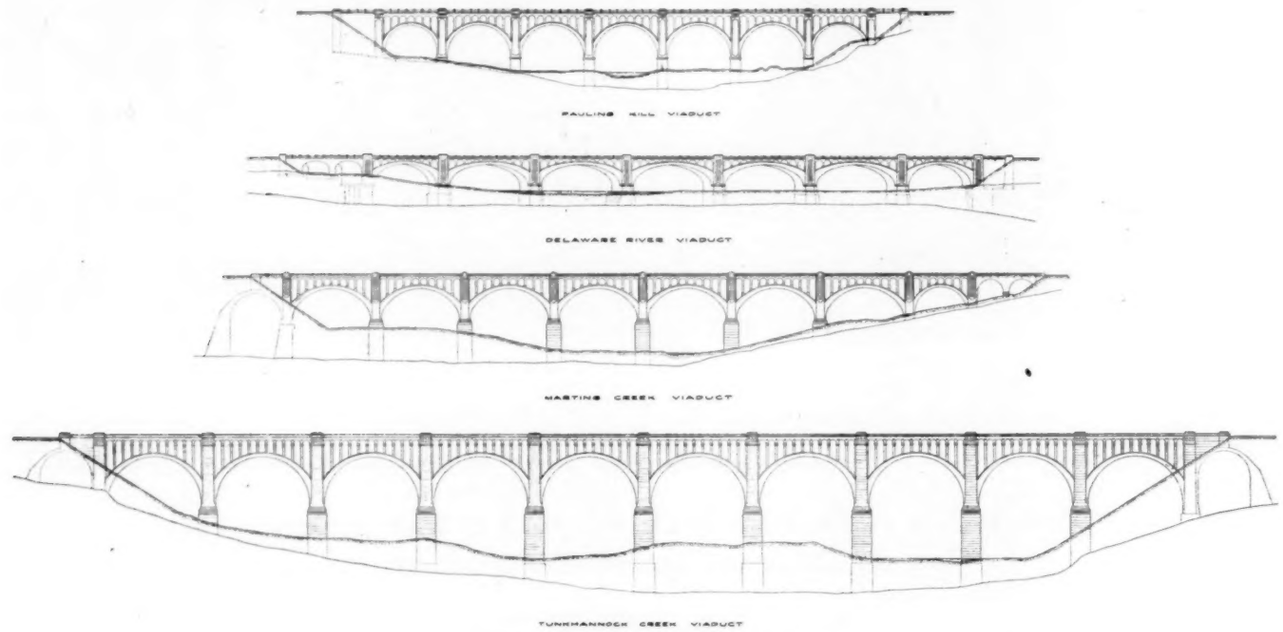


Fig. 2—Four Large Arch Viaducts

Paulins Kill Viaduct, length 1,100 ft., height above water 117 ft.
Delaware River Viaduct, length 1,450 ft., height above water 64 ft.
Martin's Creek Viaduct, length 1,600 ft., height above water 150 ft.
Tunkhannock Viaduct, length 2,375 ft., height above water 240 ft.

top" and "I-beam top" culverts. These were the earliest structures of concrete but were so designed that the rails or I-beams carried the railroad loading while the concrete filled in to form a solid floor as a protection for the steel. There were also a few concrete arch culverts of smaller spans.

The first structure of any size or importance to be built of concrete on the line, was the arch at Bridgeville, N. J., erected in 1903 to replace a double-barreled arch culvert

shops were built and concrete used in the construction of all of the foundations and floors and subways, and in some instances for the roofs of the various buildings.

Isolated structures of the minor type continued to be constructed of concrete, but the first *reinforced* concrete structure was a coal trestle built at Hoboken, N. J., in 1906-1907. Here, the track stringers were designed as reinforced concrete beams, supplanting the use of steel rails or I-beams.

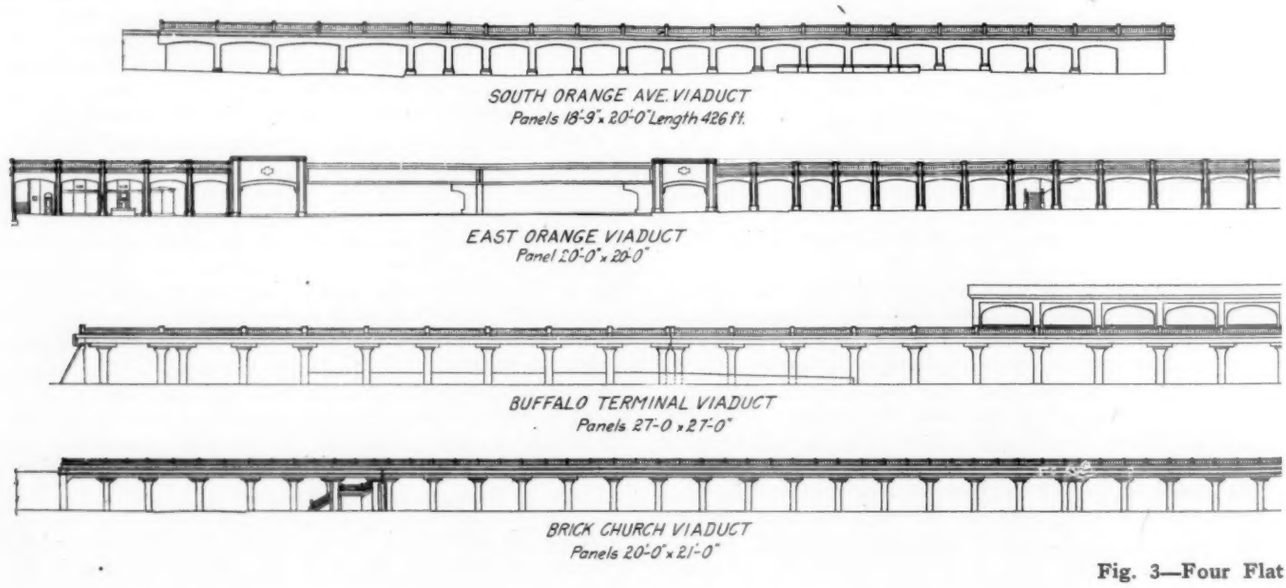

SOUTH ORANGE AVE. VIADUCT
Panels 18'-9" x 20'-0" Length 426 ft.
EAST ORANGE VIADUCT
Panel 20'-0" x 20'-0"
BUFFALO TERMINAL VIADUCT
Panels 27'-0 x 27'-0"
BRICK CHURCH VIADUCT
Panels 20'-0" x 21'-0"

Fig. 3—Four Flat

This trestle of 112 ft. of mass wall aproaches, 226 ft. of reinforced concrete stringers on piers, with temperature reinforcement in each face, and 159 ft. of coal storage bins, entailing the use of reinforced concrete stringers supported on reinforced concrete girders, which in turn are supported by reinforced concrete walls, retaining the coal carried on a reinforced concrete floor, which spans between concrete retaining walls.

At each pier along the open trestle a rail is imbedded transversely, overhanging both sides sufficiently to support a concrete walk. This is evidently a substitute for a reinforced concrete bracket or cantilever, confidence in reinforced concrete not having advanced sufficiently at that time to permit of reinforced concrete cantilevers.

Somewhat later a skew arch bridge was designed and built

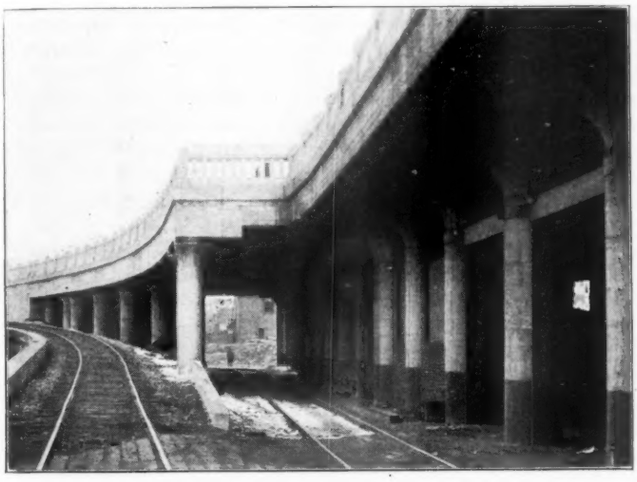


Fig. 4—Showing Flat Slab Construction at Buffalo

over Washington Avenue, Washington, N. J. The right span of this bridge is 44 ft. clear, and as the central angle is 42½ deg. there is a skew angle of 47½ deg. This excessive skew was modified by forming the faces of the bridge to a skew of 25 deg. with the center line of the avenue. This arch is segmental in form with a 10-ft. rise and a 3-ft. crown thickness without any reinforcement, while the elevation of the top of parapet is that of the top of rails. The abutments are supported on pile foundation. One-half of the roadway is carried by the roof of a two-span box culvert, reinforced with rails forming a then typical double rail-top culvert.

At about this time the design and construction of the various shops at Scranton, Pa., was begun and it was decided to use reinforced concrete as the material of construction. This project included a vast program of buildings for many purposes and various conditions of loadings from light office loads to locomotive loading and entailed several years of continuous construction.

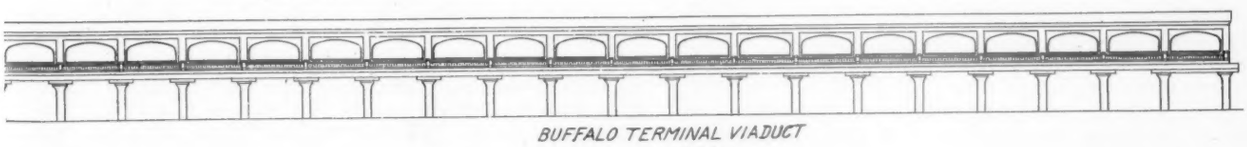
Late in 1907, the preparation of plans was begun for the Hopatcong to Slateford cut-off, now known as the Lackawanna Railroad of New Jersey. The character and object of this improvement have been described so often and thoroughly that no detailed repetition is needed here. However, it was on this improvement that concrete and reinforced concrete were employed by the Lackawanna for the first time on so large a scale and for so many types of construction. There were the two important viaducts, the Delaware River structure of elliptical arches, and Paulin's Kill with semicircular arches, and while the majority of the bridges, both over and undercrossings were of the arch type, there were a number of flat construction, both of the "T" beam and simple slab type.

Altogether there were 73 concrete bridges and culverts of which about 50 were major structures, concrete construction having attained to sufficient magnitude to justify the organization of a special concrete department to handle the design of all concrete structures. The successful completion of this cut-off, entailing the placing of 260,000 cu. yd. of concrete and 5,000,000 lb. of reinforcing steel, marked an epoch in railroad construction and put concrete in the foreground as the material for consideration in subsequent important construction work. Therefore in the planning of the Pennsylvania cut-off from Clark's Summit to Hallstead and in connection therewith, the projection of the Tunkhannock viaduct, concrete construction occupied a strategic position and had a strong line of defence against the proposed steel structure, despite the advantage of first cost and of established usage which the latter type enjoyed. It is interesting to note that an effective argument for concrete in consideration of the type of structure to be used for the Tunkhannock viaduct, was the striking effect produced by a wooden model of the proposed viaduct so perfect as to all its architectural details, and color as to simulate the completed structure. This model made so favorable an impression that it was shipped to the Leipzig Exposition.

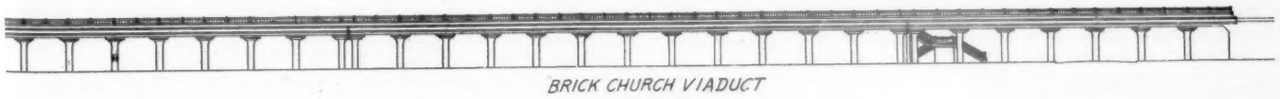
The Pennsylvania cut-off was by far the largest improvement, both in mileage and cost, undertaken by the railroad, and is described in an interesting article by G. J. Ray, chief engineer, appearing on page 1243 of the *Railway Age* of December 24, 1921. With few exceptions all the structures are of concrete, of which, of course, the Tunkhannock and Martin's Creek viaducts are the outstanding features. The total number of structures on this improvement, exclusive of these two viaducts, is 86, of which seven are of structural steel, and 79 are of concrete, 42 of them being major structures. Like the New Jersey cut-off, there have been many articles descriptive of the general scope and details of construction and of the two viaducts, that it is only necessary to summarize by stating that 345,000 cu. yd. of concrete and 6,250,000 lb. of reinforcing steel were placed in the bridges and culverts of this cut-off.

Between the projection of the two "cut-offs" there was begun an ambitious program for the elimination of all

EAST ORANGE VIADUCT
Length 842 ft



BUFFALO TERMINAL VIADUCT
Length 1100 ft.



BRICK CHURCH VIADUCT
Length 1085 ft.

Slab Viaducts

grade crossings in the thickly populated districts along the main line and also on the Montclair branch. The part of this program first to be carried into execution was the elimination of the crossings on the branch from the East Orange city line to the terminal at Montclair and incident thereto the construction of new passenger stations. Embraced in this work are arch construction both overhead and undercrossings, flat construction and, for the larger spans, structural steel encased in concrete. In connection with this improvement, reinforced concrete coal pockets were constructed at Montclair.

After the completion of this first portion of the program of elimination, there were executed at various times the improvements along the main line to Morristown, eliminating successively the grade crossings at Chatham, Madison, South Orange, Morris Plains and Orange, culminating in the East Orange improvements now in progress with the completion of which all grade crossings from Mount Taber, N. J. and Montclair to Hoboken will have been eliminated. In all of these improvements, concrete, both plain and reinforced, is the principal medium of construction, particularly in the East Orange improvement where the only structural steel work occurs at the Main street crossing where the excessive skew of the angle of crossing precluded the use of reinforced concrete as an undercrossing. This street crossing is part of a viaduct, the remainder of which is of concrete.

There were important improvements at other points on the line, notably at the west end at Buffalo where a new terminal was designed and constructed. The tracks there are carried on an elevated structure and the portion under the train shed is utilized as a warehouse and provided with tracks for drilling purposes. There again because of the magnitude and importance of the structure, the question of the type and material of construction had to be considered seriously before a final decision was made. Concrete was selected because of the uniformity afforded by the flat slab construction and the reduction in maintenance costs over those for structural steel.

During all this time and since, isolated grade crossing eliminations and bridge renewals have been executed in concrete at many points along the line, except where clearance requirements and excessive spans made its use prohibitive. Among other structures to be designed and built of reinforced concrete are buildings, cinder pits, sand storage bins, transmission poles, etc.

In all of the concrete work along the Lackawanna the distinctive feature is the attention paid to architectural details to produce artistic effects in harmony with the use and environment of the structure under consideration. It is the writer's opinion that this railroad is one of the few, if not the only one in the country that does not submerge all architectural and individual effects by the use of standards throughout, with the result that the structures on this line stand out as individual bridges, stations, etc.

The structures herein described have been selected for the purpose of illustrating certain types and to point out particularly interesting examples as indicating divergence from the ordinary.

Several Large Arch Viaducts Have Been Built

Of all the structures, perhaps the best known are the four arch viaducts, because of the interest attaching to their magnitude and because they perhaps best illustrate the individuality of treatment above mentioned. While the Paulin's Kill and Tunkhannock viaducts are similar to each other in so far as they both have sufficient head-room to permit of the use of semi-circular arch spans and spandrel arches, their treatment both architecturally and structurally is absolutely dissimilar.

The difference architecturally is apparent to the eye in the difference of the piers, pilasters and railings. The structural difference is chiefly in the use of the buried abutment arch spans of the Tunkhannock (employed as well in connection with the Martin's Creek), eliminating the otherwise high walls used at the abutments of the Paulin's Kill viaduct, the selection of the rib instead of the barrel type and the provision of a ledge to support centering later ornamentally treated, to obviate the necessity of erecting falsework for arches from the ground.

A comparison of the Delaware River and Martin's Creek viaducts, in both of which the rise is considerably less than half the span, discloses the use of a segmental form of arch in the design of the Martin's Creek as contrasted with the elliptical form in the earlier Delaware river viaduct which is of the barrel type with "U" abutments while the later structure is of the rib type with centering ledges, and submerged arch abutments. Architecturally there is a marked difference in the treatment of the pilasters and railing. Figure 2 shows these four viaducts and the data concerning them.

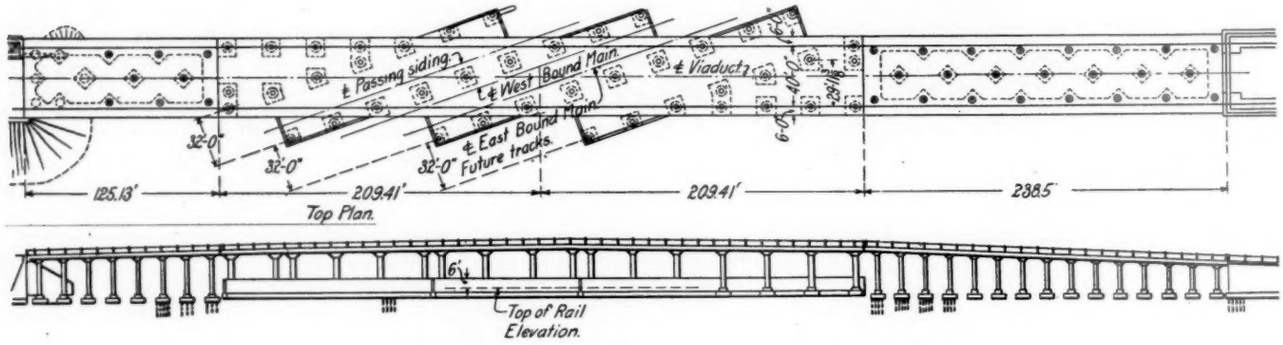


Fig. 5—Flat Slab Viaduct Over the Track at Sanford's Crossing

Flat Slab Viaducts

There are also four long viaducts of flat-slab type, viz: The Buffalo terminal, the South Orange avenue viaduct, and the Brick Church and East Orange viaducts now in the course of construction in connection with the East Orange improvements. Here, as in the case of the arched viaducts, it may be noted that each is treated, so far as architectural details are concerned, absolutely independently of the others, and while two of the structures have cantilever fascias and the other two columns and pilaster fascias, they also differ from each other in architectural details. The structures of the cantilever fascia type are the Buffalo terminal and the Brick Church viaduct, while the South Orange avenue and the East Orange viaducts are of the fascia column type.

The viaduct at the Buffalo terminal is by far the largest, both as regards area and cost, having an extreme width of 154 ft. to accommodate seven tracks at its wide end and

narrowing down to a 46 ft. width for three tracks with a total length of somewhat over 1,100 ft.

The columns supporting the structure are cylindrical, reinforced by both longitudinal bars and spirals and are spaced 27 ft. center to center in both directions, the transverse section being completed by 9 ft. 6 in. cantilever spans at each side. The slab, two feet thick, is increased in thickness at the supports to form drop panels and is reinforced with four bands of steel reinforcement, running respectively longitudinally, transversely and in each of the diagonal lines, with bars from each band bent up at the supports to take shearing stresses and those due to negative moment. This slab, beside carrying the tracks and platforms, supports the column concentrations of the train shed roof for the major portion of its length. The train shed columns surmounting this slab are spaced 27 ft. on centers longitudinally to correspond to the spacing of the columns below; transversely, however, the spans are increased sufficiently to permit of spanning over two tracks and center to center of 20-ft. platforms so that some of these columns transfer concentrated loads to the slab which distributes them to the lower columns. The foundations throughout this improvement are on piles surmounted by heavy concrete footings, all connected by reinforced concrete struts in both directions.

The three other viaducts provide facilities for three tracks throughout with station platforms between two of the tracks and on one side of the third, having a width of about 80 ft. in the vicinity of the stations and narrowing down to 46 ft. at the ends.

The East Orange viaduct is complicated by the fact that the crossing at Main street is on a considerable skew and requires long spans, precluding the use of this type of construction and necessitating the use of I-beams encased in concrete with fascia girders supporting the skew ends. This problem was solved architecturally by the use of concrete portals over the sidewalk spans adjacent to the two road spans. This treatment is very effective.

The shortest of the viaducts is the South Orange avenue viaduct, which is 426 ft. long and was built without expansion joints. The others are of very nearly equal length, but while the Buffalo viaduct has but one expansion joint which occurs at the change of section, the Brick Church and East Orange viaducts have joints at intervals of 250 to 300 ft. The columns are spaced 20 ft. center to center longitudinally for the three viaducts, except at the street crossings, of which that at South Orange avenue has the longest spans, these being 33 ft. center to center. The transverse column spacing varies in the three viaducts. At Brick Church the transverse spacing is 21 ft. with two cantilevers of approximately 7½ ft. each while at East Orange and South Orange, where fascia columns are used, the column centers transversely are 20 ft. and 18 ft. 9 in., respectively. Figure 3 shows the four viaducts for comparison with the information concerning each of them.

Overhead Highway Flat Slab Viaduct

While the above mentioned are the only viaducts of this flat slab type to carry railroad loadings, there is also a viaduct over the railroad tracks carrying the highway loads of Newark Turnpike, at Kearney, N. J., known as Sanford's Crossing (Fig. 5). This was an unusually difficult grade crossing elimination, due to the character of the soil, the proximity of the trolley line and the Pennsylvania railroad shops crowding the work. It was further complicated by the extreme skew of the angle of crossing (70 deg. 48 min.) as well as by the inordinately large spans made necessary by the requirement of spanning two tracks with the necessary side clearances, resulting in spans of 32 ft. center to center in both directions. The columns for these spans are supported on four rows of continuous piers acting as guard walls, carried to a height of 6 ft. above the top of rail as a protection against derailment. The approaches are smaller spans of 22 ft. 6 in. center to center with diagonal spacing of columns and sidewalks overhanging on either side. Expansion joints are placed at both ends of the main spans. All the foundations on this viaduct, the length of which is 782 ft. exclusive of retaining walls, are supported on piles, the columns of the approach spans being supported on clusters with individual footings, while those of the main spans are continuous. A peculiarity of the columns on this structure is their octagonal shape which, though attractive in appearance, was found to be excessive in cost of forming and their use was not repeated.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING during the week ended September 30 was the largest for any week since October, 1920. The total showed another increase of 15,000 cars as compared with the week before, to 988,381, which was within 3,902 of the loading during the corresponding week of 1920, when the total was 992,283, and was 83,550 in excess of the loading for the corresponding week of last year. As compared with the week before coal loading increased from 187,896 to 189,349, and there were also increases in the loading of all classes of commodities except grain and grain products and forest products, but the principal increase was in miscellaneous freight which increased nearly 10,000 cars. Increases as compared with 1920 were shown in grain and grain products, livestock, merchandise and miscellaneous. In the Alleghany, Southern, Central Western and Southwestern districts also increases were shown as compared with 1920. While grain loading was less than that for last year the total loading to date in 1922 is in excess, not only of 1921, but also every other year. The summary as compiled by the Car Service Division of the American Railway Association is shown in the accompanying table.

The freight car shortage showed another increase during the last week of September to 130,325, which included 66,529 box cars and 38,954 coal cars, while the surpluses amounted only to 6,593.

The railroads have been furnishing a steadily decreasing percentage of the cars required for coal loading, according to the weekly reports of the Car Service Division of the American Railway Association. For the week of September 23 the percentage of cars placed to cars required was 58, as compared with 63, 73, 78 and 82 in the four preceding weeks, respectively. For the week of September 23 the cars required were 367,616, as compared with only 193,660 in the corresponding week of last year; the cars placed were 212,685 and the cars loaded 181,346, an increase of 21,580 or 13.5 per cent over last year.

The number of locomotives out of service for repairs showed an increase during the first half of September as compared with the last half of August. On September 15 the number requiring over 24 hours for repairs was 16,572 or 25.8 per cent, as compared with 25.3 per cent on September 1, and the number out of service for repairs requiring less than 24 hours was 3,585 or 5.6 per cent, as compared with 3,573 on September 1. The number of serviceable locomotives stored was also reduced from 2,842 to 1,982.

In a circular addressed to the shipping public, asking co-operation to bring about the most economical use of cars, M. J. Gormley, chairman of the Car Service Division, says:

"Prior to the strike of the shop crafts on July 1 the Car Service Division prepared an estimate of car loading for the remainder of 1922 together with probable transportation conditions coincident with the peak of railroad traffic generally reached in October.

"The chart then prepared is attached. It outlines load-

ing for 1920 and 1921, and for 1922 up to July 1 of, (1) Coal, (2) All commodities except coal, (3) Total all commodities. The estimated figures subsequent to July 1, 1922, are shown by the light dotted line. The actual loading July 1 to date is shown in heavy line marked 1922. This estimate was prepared without knowledge of the shopmen's strike and was withheld account conditions incident to the strike.

It was estimated—

1. That coal mining, suspended in union fields since April 1, would generally be resumed not later than August 1, 1922.

2. That the loading subsequent to July 1 would reasonably be expected to increase at a ratio corresponding to the average of years 1919, 1920 and 1921.

3. That while there would be a decided increase in coal loading subsequent to August 1 the production would not reach the record of 1920 for the reason that it was generally conceded there was a production considerably beyond the actual demand in the fall months of that year.

"Records indicate that the railroads handled at one period it would be and which estimate was made prior to the strike of the shop crafts.

"It is extremely important from the standpoint of shippers as well as the railroads that extraordinary methods of co-operation be adopted along the following lines in order to measurably meet the transportation needs, particularly of the next few months.

1. Load cars to their full carrying capacity.

Figures show that 2,250,000 less cars would have been used during the year 1921 to handle the same amount of tonnage provided the cars had been as heavily loaded during the entire year of 1921 as they were during the last quarter of 1920. The light loading of equipment constitutes a very great waste in transportation, including the addition of empty mileage for the return of excess cars in service for handling the same tonnage.

2. Unload cars promptly.

Save car delays. At least 150,000 cars are unloaded every week day. If 24 hours can be saved in more promptly unloading one out of every ten cars placed for unloading there will be 15,000 additional cars available for shippers. The railroads do not want demurrage.

3. Order cars in advance, and on a basis of what will

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, SEPTEMBER 30, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	7,527	3,736	55,492	1,644	5,886	3,822	64,242	94,674	237,029	.....	.....
	1921	8,912	3,123	46,550	1,571	4,577	1,713	63,684	81,945	.....	212,075	242,719
Allegheny	1922	3,110	3,717	56,345	4,613	3,159	9,361	50,409	78,630	209,344	.....	.....
	1921	2,757	3,321	49,017	2,586	2,846	5,391	48,204	59,818	.....	173,940	203,100
Pocahontas	1922	254	540	16,690	228	1,448	34	5,111	3,490	27,795	.....	.....
	1921	283	312	22,831	184	1,193	97	5,692	4,170	.....	34,762	37,896
Southern	1922	3,842	2,827	22,124	902	18,363	1,203	37,515	43,718	130,494	.....	.....
	1921	4,103	2,150	24,414	405	15,950	302	40,761	43,847	.....	131,932	129,677
Northwestern	1922	18,952	9,702	10,048	1,408	15,533	32,597	28,934	41,891	159,065	.....	.....
	1921	19,340	8,406	9,934	502	11,989	17,363	29,006	41,930	.....	138,470	167,648
Central Western	1922	13,399	15,344	21,254	504	7,313	2,192	32,926	58,700	151,632	.....	.....
	1921	17,030	12,657	22,162	211	6,860	723	32,593	52,122	.....	144,358	143,446
Southwestern	1922	5,045	3,964	7,396	157	7,040	562	15,380	33,478	73,022	.....	.....
	1921	4,797	3,010	5,446	129	6,438	883	16,165	32,426	.....	69,294	67,797
Total Western districts	1922	37,396	29,010	38,698	2,069	29,886	35,351	77,240	134,069	383,719	.....	.....
	1921	41,167	24,073	37,542	842	25,287	18,969	77,764	126,478	.....	352,122	378,891
Total, all roads	1922	52,129	39,830	189,349	9,456	58,742	49,777	234,517	354,581	988,381	.....	.....
	1921	57,222	32,979	180,354	5,588	49,853	26,472	236,105	316,258	.....	904,831	.....
	1920	43,632	33,383	209,898	14,790	62,085	78,458	203,506	346,531	.....	.....	992,283
Increase compared	1921	.....	6,851	8,995	3,868	8,889	23,305	.....	38,323	83,550	.....	.....
Decrease compared	1921	5,093	.....	.....	.....	.....	.....	1,588	.....	.....	.....	.....
Increase compared	1920	8,497	6,447	.....	.....	.....	.....	31,011	8,050	.....	.....	.....
Decrease compared	1920	.....	.....	20,549	5,334	3,343	28,681	.....	.....	3,902	.....	.....
September 30	1922	52,129	39,830	189,349	9,456	58,742	49,777	234,517	354,581	988,381	904,831	992,283
September 23	1922	52,379	36,896	187,896	8,671	58,853	49,587	234,371	344,638	973,291	873,641	1,008,109
September 16	1922	52,090	34,929	172,241	8,188	57,371	53,293	234,513	333,294	945,919	852,552	991,166
September 9	1922	47,732	29,512	139,570	8,418	51,906	53,833	203,666	298,107	832,744	749,552	883,415
September 2	1922	54,019	31,847	149,487	8,389	58,706	62,354	233,550	333,246	931,598	831,288	961,633

in 1921 within 5 per cent of the previous peak car loading of the country, which occurred in 1920, and this was done without car shortage and without transportation difficulties, but during that period there was pronounced efficiency in the handling of cars on the part of shippers and the railroads. It was the conclusion prior to July 1, 1922, that with the continuation of this efficiency in transportation a peak loading of 1,100,000 cars would be reached in October, 1922, which figure is 10 per cent in excess of anything of record heretofore and that this would be accomplished without appreciable car shortage or transportation difficulty.

"It, of course, is impossible to forecast the cumulative effect of the transportation difficulties of the past three months, but the actual loading of traffic, other than coal, since July 1 as shown by the chart, closely approximates the estimates made. The coal loading since the resumption of general mining is only slightly less than it was estimated be loaded within a 24 hour period. Do not hold cars for prospective loading.

This will be helpful in having requirements met, and will conserve equipment available for general distribution. It helps no one to pyramid orders and disrupts efforts of car distributors to meet demands uniformly.

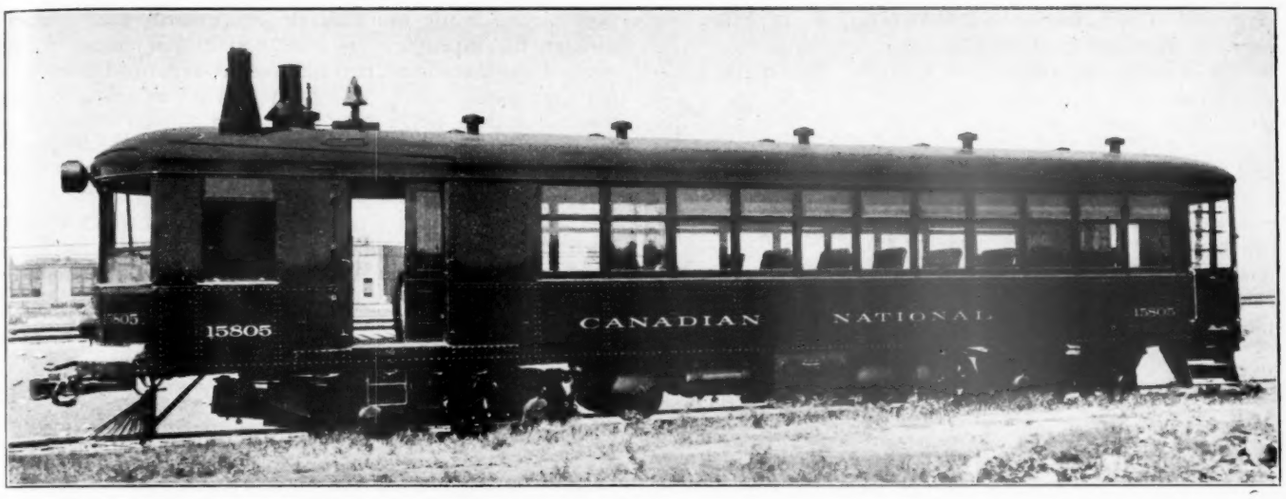
4. Place orders requesting reconsignment with promptness.

It is easily possible to avoid at least two days' delay in car movement by this means.

5. Issue bills of lading promptly.

"Freight cars are built to haul goods, not to store them. They should be loaded to the limit of their capacity. They should be loaded and released with the utmost promptness.

"By co-operating in carrying out these suggestions all will be contributing in large measure to the meeting of current transportation requirements."

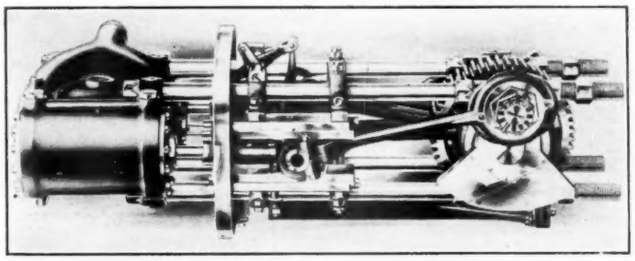


Unit Steam Motor Car Built for the Canadian National Railway

Steam-Propelled Unit Railway Motor Car

Improved Power Plant with Water-Tube Boiler and Oil Burner Characterize Canadian National Car

MANY RAILROADS within the past year have turned to the self-propelled passenger car as a device which would aid materially in reducing operating costs on branch lines, or in sections where the traffic is light. Much of such equipment tried has followed closely the lines of development of the gasoline-engine motor bus used on highways



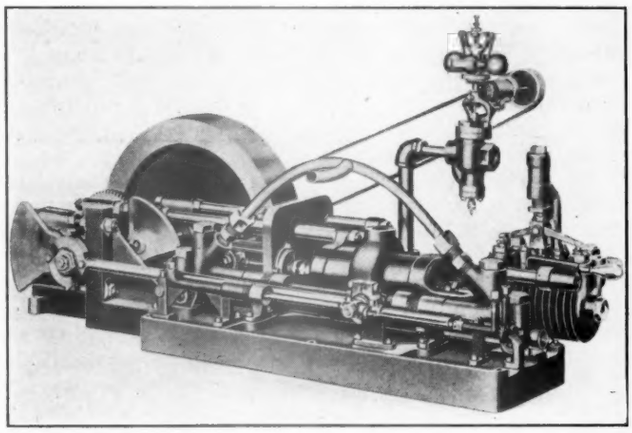
The Main Engine is of the Two-Cylinder Simple Type

with more or less modifications to adapt it for use on railroad tracks.

A distinctly different car of the self-propelled type is the oil-burning, steam-driven car built by the Unit Railway Car Company, Boston, Mass. One of the early cars of this style was shown at the Atlantic City convention in 1919, a description of it being given in the *Railway Age,* June 18, 1919. From experience gained through observation of the cars which have been in service since that time, the builders have been able to make a number of improvements in details of design. These have been incorporated in the cars recently delivered to the Canadian National, the Boston & Maine and the Uruguayan Government.

The power plant in the Unit railway steam cars embodies the principles used in the Stanley steam automobiles and is built under the same patents. Ease and flexibility of control with large reserve capacity for quick acceleration, or for use on grades is a characteristic of these cars. They are usually operated as a single car unit, but have sufficient power for pulling a trailer, or can be used for switching purposes when necessary. Maintenance can be attended to easily by ordinary railroad mechanics and the costs should be low.

The delivery of the car to the Canadian National was hurried in order that it might be shown at the annual exposition in Toronto. Without waiting for a preliminary trial, it was started from Boston under its own power and ran to Toronto, a distance of 660 miles, without interruption, except for delays incidental to orders from the operating



Auxiliary Steam Engine with Air Compressor, Feed Water and Oil Pumps

departments. The running speed for much of the distance was between 45 and 55 miles per hour.

Car Body and Truck

In appearance, as will be noted from the photograph, the car bears a closer resemblance to the usual steam railroad passenger, or to an interurban electric car than is the case with many of the gasoline engine cars. The body is of steel construction and the car is equipped with standard

couplers. The Canadian National car is 50 ft. 7 in. long over end sills and is divided into four compartments. Next to the driver's compartment, in which is located the boiler and auxiliaries, is a baggage compartment. There is also a smoking compartment separated by a partition from the main part of the car. There are seats for 38 passengers and, in addition, two folding seats are provided in the baggage compartment, which furnish room for eight additional passengers if desired. The rear platform is enclosed and provided with doors. A small toilet room occupies one of the rear corners of the passenger compartment. Current for electric lights is supplied by a small generator driven by the auxiliary engine.

The trucks are of a modified arch bar pedestal type of light construction. The wheels are 34 in. in diameter and ball bearings are used in the journal boxes. The distance between truck center pins is 28 ft. The forward truck has a wheel base of 6 ft. 1 in. and is so arranged that the distance from the center bearing to the front axle is 2 ft. 1 in., and from the center bearing to the trailing axle the distance is 4 ft., this being done in order to increase the percentage of weight on the front pair of wheels, which are the drivers. The rear truck has a wheel base of 5 ft. 6 in.

The car is designed for single-end operation, but may be driven at equal speed in either direction. The weight disposition is as follows:

Light weight of car complete	59,000 lb.
Weight on front driving axle	25,500 lb.
Weight on front trailing axle	12,400 lb.
Weight on rear truck	21,100 lb.

As the weight of the power plant complete with all auxiliaries is 13,000 lb., the weight of the body and trucks is but 46,000 lb.

The Water-Tube Boiler

The boiler is of the water-tube type and is made in 12 sections, being constructed throughout of Shelby seamless boiler tubes. Each section consists of a front and back vertical header, the two being joined by 22 water tubes inclined at about 11 deg. to the front header and a single connecting steam tube at the top inclined at about 1 deg. to the back header. All tubes are straight, in which respect they differ from the earlier design. The tubes are electrically welded to the headers and opposite each end of every tube an opening is provided in the headers through which the tube can be inspected, cleaned or in case of a rupture, can be temporarily plugged until a new tube can be welded in place.

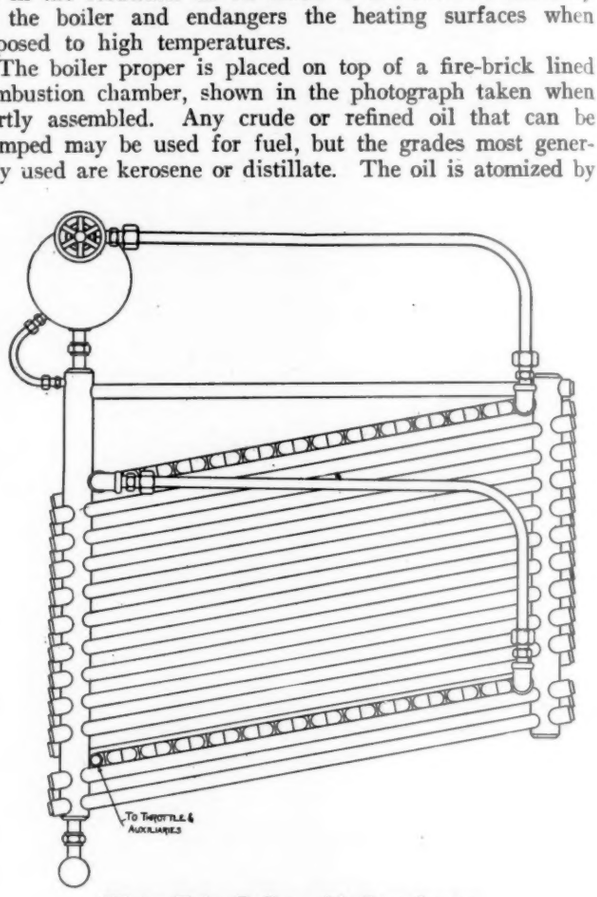
Each boiler section when ready for assembly is subjected to a hydrostatic test of 3,500 lb. per sq. in., and while under this pressure is given a babbitt hammer test for leakage or defective tubing.

The front headers are connected by parabolic shaped tubing to a steam drum. The construction of the drum and connections is such that they act as a desaturator, and any moisture separated from the steam is returned automatically to the boiler. The lower ends of the front headers are connected to a mud drum.

From the steam drum the dry steam passes through the superheater in series, an arrangement which has been found materially to increase the life of the superheater units. As will be noted from the drawing, the superheater pipes are in two banks, one near the top and the other near the bottom. Unions are provided which permit of their easy removal. All unions and connections are of special construction and made of monel metal to resist the high temperatures. All the steam is superheated, no saturated steam being used for auxiliaries or for other purposes. By using superheated steam for all purposes, there is always some flow through the superheater for operating the auxiliary engine, atomizer, blower and ejector.

The steam pressure ordinarily carried is about 800 lb. per sq. in., while the ultimate temperature after passing through the superheater is from 650 to 800 deg. F. The steam from the engine is condensed as explained later, and fed back to the boiler. A gravity-feed oil separator is used together with a boiler compound to eliminate the effect of oil in the feedwater as oil tends to decrease the efficiency of the boiler and endangers the heating surfaces when exposed to high temperatures.

The boiler proper is placed on top of a fire-brick lined combustion chamber, shown in the photograph taken when partly assembled. Any crude or refined oil that can be pumped may be used for fuel, but the grades most generally used are kerosene or distillate. The oil is atomized by high pressure superheated steam. The supply of fuel oil is carried in a tank underneath the car, from which it is pumped as explained later.



Water-Tube Boiler with Superheater

Main Engine and Condenser

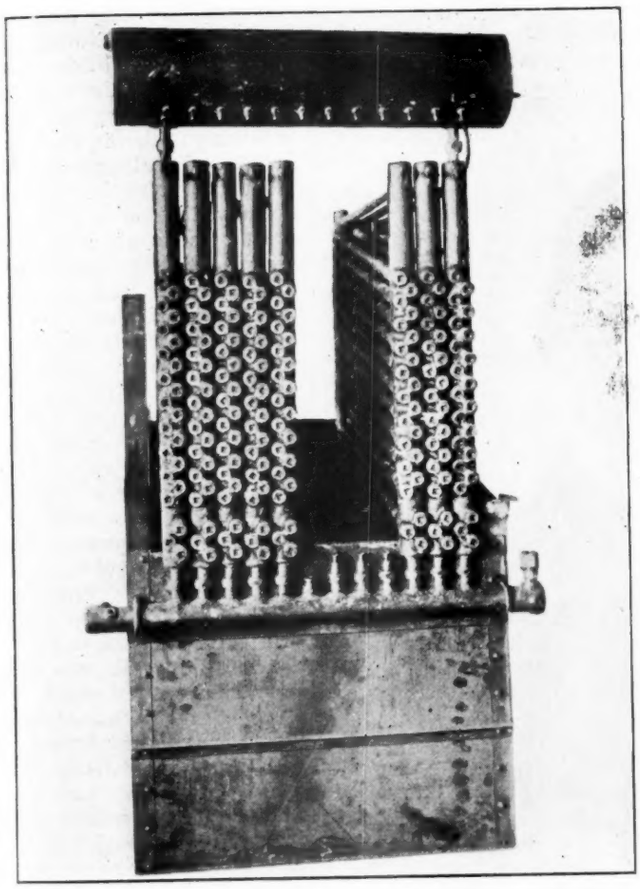
The car is propelled by a simple two-cylinder engine mounted on the front side of the forward truck, power being transmitted to the axle by a single spur gear pressed onto the center of the axle. The gear ratio ordinarily employed is approximately 1½ to 1. When the car is traveling at a speed of 30 m.p.h. the engine, which has an 8-in. stroke makes about 433 r.p.m., and has a piston speed of 577.5 ft. per min. The engine is entirely enclosed and thoroughly insulated. The gears run in a bath of oil.

The high pressure superheated steam is carried from the throttle to the engine by a flexible pipe having four special steam packed joints. The exhaust steam from the main engine and also from the auxiliary engine is conducted to an air cooled condenser located on the roof of the car at the forward end. The condensed water flows back to the tank underneath the car. There are two water tanks, one holding 175 gal. and the other 90 gal. In winter the exhaust steam may be passed through heating coils in the car. The supply is sufficient to keep the car comfortable in the most severe weather.

The auxiliary steam engine, which is located in the driver's compartment, needs little explanation. It drives the two feedwater pumps, the fuel-oil pump, the duplex cylinder

lubricating oil pump, the air compressor, and the 2-kw. D.C. generator. The engine is run at a constant speed and governed by a ball type governor.

Boiler feed is accomplished as follows: The two pumps running at constant speed deliver the hot feedwater through the automatic by-pass to the condensate tank. When the water level in the boiler falls below the automatic by-pass tube, expansion of the tube closes the valve and the water is pumped into the boiler until the tube is submerged, or enough of it to establish and maintain a nearly constant water level irrespective of the load on the boiler. When the throttle is open under heavy load, there will be a slight drop of water level as indicated on the water column. This is absolutely reliable, for when the throttle is again closed



Partly Assembled Boiler on Combustion Chamber

the water level will rise to the normal or light load level. Due to the high pressure, a water gage is not used, but an indicator mounted on top of the water column and operated by the expansion of that portion of the water column above the water level has been substituted. The water column is equipped with trycocks which permit the water level to be checked for accuracy.

The fuel oil is pumped from the 175-gal. storage tank underneath the car, located in front of the rear truck, to a 20-gal. auxiliary atomizer tank bolted to the partition near the roof in the baggage compartment, which gives a constant head to the atomizer. From the tank the oil flows by gravity to the dual automatic control mechanism, which is actuated hydrostatically by the throttle operation, in that the slightest throttle opening causes a fluid pressure drop in the superheaters, thereby releasing the hydrostatic head on the dual automatic diaphragm permitting a simultaneous opening of the fuel oil and high pressure superheated steam passages to the atomizer. The atomized fuel is ignited by the pilot burner. The fire control is such that a light fire will be maintained for light loads and correspondingly increased for heavy loads. When operated at full loads, the temperature in the chamber is from 2,800 to 3,100 deg. F. and every brick and joint of fire clay is glowing with incandescense and radiates heat to assist in the combustion which is complete before the gases come in contact with the boiler-heating surfaces.

The air compressor, as will be noted from the illustration, is in tandem with the auxiliary steam engine cylinder, the air piston being mounted on an extension of the steam piston rod. The compressor is lubricated by an adjustable oiler in the air intake. A governor is located over the inlet valves, and when the desired pressure has been attained both inlet valves are held open, permitting cold air to circulate in the cylinder until the next pressure drop occurs. The compressor cylinder is air cooled. The capacity of the air compressor is 11½ cu. ft. of free air per minute, which is more than sufficient for the operation of the air brakes with which the car is equipped.

Lubrication of both main and auxiliary engines is by splash, thereby lubricating the housing or the driving axle as well as every portion of the engine with a flood of oil. The cylinders are lubricated through blinkers on the instrument board, thence to the steam lines to either engine.

The low water automatic control is a device by which the flow of fuel oil to the atomizer is shut off before the water in the boiler gets dangerously low. The water connection to the low water automatic control is in series with the automatic by-pass in order to utilize the same temperature that operates the automatic by-pass. Therefore, should the automatic by-pass fail for any reason, or if the pumps should not supply the boiler with water to meet boiler evaporation requirements, the expansion tube of the low water automatic control is filled with steam at a high temperature, closing the valve in the head which at once cuts off the fuel oil supply to the atomizer. The value remains closed until the water level is restored, after which the atomizing burner will again function to restore and maintain the steam pressure.

Tests and Efficiency

Records taken from cars in service show an average consumption of approximately 0.7 gal. of distillate, or 0.65 gal. of kerosene per car mile. At the low price at which distillates can be obtained in many places, this represents a fuel cost of about four cents per car mile. For lubricating purposes two gallons of a special cylinder oil has been found to be sufficient for a 400-mile run and one gallon of engine oil for the same mileage.

The mechanical efficiency in the main engine and drive is high. The boiler efficiency when using superheated steam at 700 to 800 deg. F. at the atomizer is said to be about 77 per cent. The time required to generate steam with storage air for the atomizer is from 20 to 25 min. and with steam at 200 lb. pressure, approximately 18 min. An evaporation of about 14 lb. of water from and at 212 deg. F. may be obtained per square foot of wetted heating surface. The main engine uses from 14 lb. to 19 lb. of water, depending upon load and grade conditions, to develop one horsepower hour.

THE EASTERN RAILWAY of France now has more than one-quarter of its locomotives fitted with audible cab signals. The total number of locomotives in service at the present time is, for passenger trains, 1220; for freight trains, 798; total 2,018. Of these, 428 passenger engines and 144 freight engines are fitted with the signal apparatus. Ramps have been installed at 390 distant signals and at 130 home signals. The company plans to fit up 1,278 more locomotives before the end of 1923, and to install 1,560 additional ramps.

Daniel Upthegrove

DANIEL UPTHEGROVE, general solicitor of the St. Louis Southwestern, who has been acting president of that company since the death of James M. Herbert on August 5 of this year, was elected president at the annual meeting of the board of directors in St. Louis, Mo., on October 3. He also succeeds Mr. Herbert as president of the St. Louis Southwestern of Texas; as president of the Dallas Terminal Railway & Union Depot Company, and as vice-president of the Arkansas & Memphis Railway, Bridge & Terminal Company.

In the choice of Mr. Upthegrove, the directors of the "Cotton Belt" have named a man who has been connected with the property for 25 years. Although he has always been in the law department he has become well known among the employees and his popularity extends from the lowest rank to the highest officers.

His greatest asset is his unusually clear grasp of the essentials of every problem with which he is confronted. He attributes his steady rise from a local "Cotton Belt" attorney at Greenville, Tex., to the highest position that company can offer, to his "early determination to make himself so useful in his job that it would be a necessary part of the road. My theory of handling any matter," he states, "is to pick out the essential things and to do them to the best of my ability." There will be no change in the present policy of operating the 1,776 miles of line, the new president has declared, and his chief occupation, he states, will be to give effect to a sentiment expressed by the late President Herbert, in the words, "The biggest man on this road is 'Old Man Service,' and service comes first."

Daniel Upthegrove

Mr. Upthegrove was born at Greenville, Tex., on May 26, 1871, in which city his father was a prominent attorney. He was sent to the Battleground Academy, Franklin, Tenn., to take his pre-legal studies. He later continued his education at Vanderbilt University, Nashville, Tenn., and at the University of Texas, 1895-96. Early in 1897 he passed the bar examinations and began the practice of law at Greenville under direction of E. B. Perkins, then regarded as one of the ablest lawyers of that state. He obtained his first legal position in 1897, and at the same time first entered railroad service, when he began to represent the St. Louis Southwestern of Texas in the local justice courts in his home town. Soon thereafter his friend and counselor, Judge Perkins, moved to Dallas, Tex., to become general attorney of the Cotton Belt of Texas, and in November, 1901, he summoned Mr. Upthegrove to become his assistant.

In December, 1916, President Herbert, recognizing the marked ability of the assistant general attorney at Dallas, offered him the position of general solicitor of the St. Louis Southwestern, with headquarters at St. Louis, Mo., which he accepted. This advancement was unexpected and made a radical change in his life plans for he had intended to develop a law practice at Dallas that would give him a remunerative income in the event that he later determined to forsake his work as a railroad counsel for general practice. While he has not come up from the ranks of "practical" railroad men, the new executive is said to have an extensive knowledge of railroad operation, gained through study and association with Mr. Herbert, whom he usually accompanied on his inspection trips over the system.

President's View on Strike Settlements

WASHINGTON, D. C.

PRESIDENT HARDING is represented as feeling that at least one of his policies for settling the railroad strike has been vindicated by the adoption on many roads of the so-called Willard-Jewell plan of settlement. Newspaper correspondents were told at the White House on Friday that it was worth their notice that the settlement of the railroad strike is continuing and that it is being made "on the basis of the original proposal of the President to the railroad executives." This proposal was the one in which he suggested that the strikers be returned to work with seniority rights unimpaired, by way of restoring the status quo as of June 30, before he made his later proposal that the question be referred to the Labor Board which had already decided it the other way. The plan of settlement which has been signed upon some 82 roads does not promise the restoration of former seniority rights but the President has been told that the practical effect amounts to about the same thing. He was told by a railroad manager, it was said at the White House, that when his road settled with the shop crafts it had 2,400 new employees to whom it had promised permanent jobs and whose services it needed to make up for the work lost during the strike. It had offered them a chance to stay but in 24 hours 2,200 of them had quit. The President considers this an illustration going to show that the seniority problem was not such a serious one as many of the railroad officers attempted to make it appear, and that 95 per cent of the serious transportation embarrassment now being experienced in many lines is due to the impaired condition of equipment due to the strike and which was represented by the railroads as less serious than it was. Apparently the President regards the illustration afforded by one railroad manager as of more importance than that of the larger proportion of roads on which the seniority question was of such import that they went ahead and beat the strike without settling. It has also been suggested that the President may have overlooked the possibility that if a large number of roads had not stood pat, the strikers on the other roads would not have flocked as new recruits to the "die-hard" roads in sufficient numbers to have aroused the interest of Mr. Jewell in seeking and making settlements with the roads which chose to deal with him.

Railroad Executives Plan to Expedite Coal

WASHINGTON, D. C.

A PROGRAM of recommendations for accelerating the transportation and distribution of coal throughout the country was unanimously decided upon by the advisory committee on transportation, recently appointed by Federal Fuel Distributor C. E. Spens, at a conference held with Mr. Spens in Washington on October 5. The details of the committee's recommendations are given in the following letter addressed to the executive heads of all the railroads by Chairman Daniel Willard:

"At a meeting held in Washington this date between C. E. Spens, federal fuel distributor, and an advisory committee on transportation, appointed by him, the situation as to fuel supply throughout the country was fully explained by the fuel distributor and the necessity for increased efforts by the carriers was emphasized. After full consideration the following recommendations were unanimously adopted as definite requirements necessary to meet the situation:

1. Unload promptly all railroad material including railroad fuel.
2. Discontinue as far as possible all maintenance and construction work requiring use of power and cars so as to turn this equipment into commercial service.
3. Use all available forces to check yards and stations for delayed cars with a view to securing not only prompt unloading but prompt movement.
4. Continue a vigorous campaign to reduce to the minimum locomotives and cars awaiting repairs.
5. Return foreign coal cars to owners or connections in home route with the greatest possible dispatch.
6. Loading of foreign coal cars in the direction of the mines, as permitted under I. C. C. Service Order No. 25, should be confined so far as possible to through movement to points on the owner's rails.
7. Conduct an active campaign to have all cars loaded to their safe carrying capacity.
8. Point out to coal operators that available coal equipment can be increased by the avoidance of sales that require abnormally long distance movement.

"All railway executives are urged to make every practicable effort to accomplish these results."

The members of the advisory committee also constitute the conference committee appointed by the American Railway Association on September 29.

An appeal to coal producers to assist in expediting the movement of coal by loading cars to carrying capacity and by refraining from the loading of coal into cars for which they have no billing, was made on October 9 by Federal Fuel Distributor C. E. Spens. Receivers of coal are asked to unload cars immediately upon arrival. Coal shippers are requested to confine their operations as far as practicable to their normal spheres of distribution, in order to reduce the amount of transportation service required. Consumers are asked, if the coal is available, to confine their purchases to the grades of fuel to which they have been accustomed.

"We have already received responses from a number of the railroads to the effect that they will co-operate to the limit along the lines recommended by this advisory committee," Mr. Spens said. "The public, however, should appreciate that there are unusually heavy offerings of traffic of all character to the railroads, and aside from the general priority orders of the Interstate Commerce Commission that now obtain, we are hoping it may not become necessary to recommend any action that might interrupt the transportation of other commodities. The priority orders now governing the handling of coal equipment are, of course, already interfering to some extent with the movement of commodities that are usually loaded in this class of equipment, but it is our great desire that there should be no greater interference with general transportation than appears to be absolutely necessary to care for the coal emergency.

"An analysis of the present coal transportation, production and present reserves clearly indicates that for some weeks the commodities covered by priority orders, particularly coal, must be given extraordinary attention. We are confident the matter has been placed before the carriers in such a way that they are fully alive to the situation, and, in spite of the existing handicaps, will do their utmost to accomplish their proportion of the burden.

"Coal producers and coal receivers can assist to a very large extent. Producers should load cars to carrying capacity, and should not load coal except to fill orders on hand; in other words, they should not have unbilled cars on hand at mines, which practice is common under normal conditions, nor should coal be billed excepting to bona fide consignees. Existing conditions will not permit of making coal warehouses out of coal equipment. Receivers of coal should arrange to unload cars immediately upon arrival."

Fuel Distributor Spens on October 4 issued a modification of his order of September 27 waiving the requirement that coal operators furnish a detailed report of the names and addresses of all consignees with car numbers and initials as to all producers who shall themselves keep and preserve full and detailed records showing such facts in such form as to enable them promptly to furnish such information as to any shipment, if and when required in any particular case. The request for the detailed report of shipments resulted in such a flood of papers being forwarded to Mr. Spens' office that it was difficult to find a force to handle them, and the order says the modification is "to facilitate reporting and assure the earliest possible receipt of the more essential information immediately required."

A slight decrease marked production of soft coal during the first week of October, according to the weekly bulletin of the Geological Survey. For three weeks in succession the output had been slowly increasing, reaching 9,776,000 net tons in the week of September 30. During the week of October 2-7 the returns so far received indicate a total of about 9,600,000 tons. The current rate of output exceeds 1921, but is far below that of other recent years. Production of bituminous coal in the first week of October of the past six years has been as follows:

	Tons		Tons
1917	10,962,000	1920	11,350,000
1918	12,398,000	1921	9,134,000
1919	11,518,000	1922	about 9,600,000

Production of anthracite continues at around 1,900,000 net tons a week. The total of all coal raised is therefore about 11,500,000 tons, considerably below the amount needed to meet current consumption and the heavy movement up the lakes, and at the same time to rebuild consumers' stocks.

Production of anthracite continues to increase and the total output in the third week after the strike was estimated at 1,947,000 net tons. Preliminary returns for last week indicate that production will again be in the neighborhood of 1,900,000 tons. The table below summarizes the preliminary returns on anthracite loadings day by day since the strike was called off.

DAILY CAR LOADINGS ON ANTHRACITE CARRYING ROADS.

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
First week after strike	928	1,783	3,272	4,046	4,704	5,088
Second week after strike	5,449	5,725	5,857	5,900	5,730	5,506
Third week after strike	5,952	5,959	5,862	5,953	6,012	6,144
Fourth week after strike	5,838	6,056	5,839	6,046	.....	.....

The all-rail movement of coal to New England through the six principal Hudson gateways increased to 3,541 cars of bituminous coal and 2,206 cars of anthracite in the week ended September 30. In addition there were also forwarded through Rouses Point in that week 75 cars of bituminous coal and two cars of anthracite. Bituminous coal is now moving into New England by rail in larger volume than at the same season last year, but the anthracite shipments have not yet attained last year's rate.

Shipments of bituminous coal through Hampton Roads decreased during the week ended September 30. Dumpings for the week totaled 283,987 net tons as against 312,003 tons in the week before.

General News Department

The Interstate Commerce Commission has announced that oral arguments will be held at Washington on November 1 in valuation cases involving about a dozen roads, including the Texas Midland, Winston-Salem Southbound, Elgin, Joliet & Eastern, Norfolk Southern, Central of Georgia and Ann Arbor.

The American Association of Railroad Ticket Agents will hold its annual convention at Savannah, Ga., on November 13, 14 and 15 Following the meeting the ticket agents will leave for a trip through Florida, stopping at the larger cities in that state, and reaching Key West on November 20, when they will embark for Havana, at which place they will remain two days.

The Railway & Locomotive Historical Society has issued Bulletin No. 3, a pamphlet of 54 pages, filled with reminiscences of old locomotives mostly those of New England roads, though space is given to the full story of the "General" of the Western & Atlantic, and the tragedy of the Andrews raiders of 1862. The illustrations include the "Uncle Tom," a 4-2-2 locomotive (with tender on the same frame) of about 18 or 20 tons, which flourished on the Fitchburg & Worcester Railroad about 1850-1860, and a number of others equally interesting. It is said that about 1843 Hinkley & Drury built a good many of this type. Charles E. Fisher, president of the society, 152 Harvard street, Brookline, Mass., desires information for a history of the early locomotives of the New York, New Haven & Hartford and of its predecessor companies in Connecticut.

Metropolitan Track Supervisors' Club

R. S. Parsons, vice-president, Erie Railroad, and Earl Stimson chief engineer maintenance of way, Baltimore & Ohio, will each give a short talk on railroad maintenance problems before the Metropolitan Track Supervisors' Club at its next meeting at the Martinique Hotel, New York City, on Saturday afternoon, October 14. Other subjects before the meeting are discussions of previous papers on laying rail and highway crossings and the presentation of a paper on rail creeping by R. L. Haring, supervisor, Long Island.

New York Railroad Club Meeting

"Speeding Up Operation" will be the subject of the meeting of the New York Railroad Club which will be held in the Engineering Societies Building, New York, on Friday evening, October 20, at 8:00 p. m. A symposium has been arranged which will cover the consideration of better operating methods and practices and ways in which the present plant and facilities may be utilized to greater advantage. This will include the use of signals to facilitate operation, how to get more work out of locomotives and better service from the cars.

Labor Board Deadlocked on M. of W. Wage Increase

Disagreement among the three groups on the Railroad Labor Board has delayed a decision on the requests of maintenance of way employees for a wage increase. On October 4 it became known that the three public members on the board favored an advance of two cents an hour in the pay of common laborers, whereas the labor group and the railway group declined to vote favorably on this increase, the former because the increase was deemed inadequate and the latter because they did not believe that such an increase was justified on the testimony presented to the board. This deadlock has continued up to the present time and the present indications are that the board's decision in the maintenance of way case will not be handed down until after the convention of the United Brotherhood of Maintenance of Way Employees and Railroad Shop Laborers at Detroit closes on October 15.

N. Y. C. Meets with Enginemen and Switchmen

Representatives of the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen and the Switchmen's Union of North America met with officers of the New York Central on October 9 for the purpose of negotiating a new agreement covering wages and working conditions. At the time of going to press these conferences were still on and it was reported that certain new working rules sought by the enginemen were delaying the settlement. The proposal for bonus payments to train and engine crews in freight service is one of the points scheduled for discussion at this meeting.

Strike Settlements in the West

The Chicago Great Western has settled with its employees with the provision that employees who took the places of strikers will head the seniority list. The shopmen's strike on the Gulf Coast Lines and the Houston Belt & Terminal has been ended by an agreement which gives the men seniority and other rights as of June 30. The seniority rights of present workmen not being disturbed. The Louisville & Nashville and delegates from all of the shops of the road have perfected a new organization of shopmen.

The Chicago, Rock Island & Pacific has renewed for one year its agreement with the Brotherhood of Locomotive Engineers covering working rules and conditions.

Conductors and Brakemen Agree with Southeastern Roads

An agreement covering wages and working regulations until October 31, 1923, was signed at Washington on October 5 by representatives of the Southeastern railroads and the Order of Railway Conductors and the Brotherhood of Railroad Trainmen. In addition to maintaining the present rates of pay and rules, the agreement provides that all disputes over wages and working conditions now pending before the Railroad Labor Board shall be withdrawn. Committees of representatives of the labor organizations and the managements were given authority to take up and consider elimination or modification of local rules during the tenure of the general agreement.

Would Abandon C. P. & St. L.

A plea for the abandonment of the Chicago, Peoria & St. Louis was made to Judge E. S. Smith in the Circuit court at Springfield, Ill., last week by Attorney A. P. Cook of New York, who represents a majority of the bondholders of that road. Mr. Cook pointed out that the road could neither pay operating expenses nor interest on its obligations. Judge Smith, who named receivers for the road in 1914, directed the attorney to file petitions with the State and Interstate Commerce commissions. The road includes 245 miles of line, extending from Peoria, Ill., to St. Louis, Mo., 200 miles; with branch lines from Havana, Ill., to Jacksonville, 42 miles and Alton to Grafton 15 miles. There are shops at Springfield and Jacksonville. It has been in the hands of receivers since 1914, and there is a constantly growing deficit.

Railway Fire Protection Association

This association will meet at Willard Hotel, Washington, D. C., on Tuesday, Wednesday and Thursday, October 17, 18 and 19. The principal committee reports to be presented are the following: On statistics—Geo. R. Hurd, chairman; on handbook—E. B. Berry, chairman; on fire prevention in shop plants—J. R. Peters, chairman; on locomotive fire hazards—Earl N. Floyd, chairman; on forms—W. C. Neely, chairman; on storage and handling of gasoline and electric motor trucks in freight depots and ter-

minals—E. J. Reilly, chairman; on safe handling of oxy-acetylene apparatus in shops—Gilbert A. Hays, chairman; on docks, piers and wharves and fuel oil on water—W. F. Steffens, chairman; on development and use of national standard couplings—F. H. Elmore, chairman; on coaling plants—W. E. Cathcart, chairman; and on protection of tie and timber treating plants—L. F. Shedd, chairman.

Papers will be read by James L. Madden, manager of the insurance department of the United States Chamber of Commerce; L. P. Kimball (B. & O.), W. T. Krausch (C. B. & Q.) and A. R. Small. There will be a general discussion on Tuesday afternoon on the I. C. C. rules for transportation of explosives, etc., and on gasoline dangers at wrecks and in loading and unloading.

The chairman of the committee on arrangements is E. B. Berry, Southern Railway, Washington.

Speakers for R. B. A. Dinner Announced

The speakers for the fourteenth annual dinner of the Railway Business Association to be held at the Hotel Commodore, New York, on November 9, have been announced as follows: Charles H. Markham, president of the Illinois Central; James A. Emery, counsel of the National Association of Manufacturers, and George Wharton Pepper, senator from Pennsylvania.

The official statement of the Railway Business Association describes the speakers as follows:

President Markham of the Illinois Central has risen from the foot of the ladder on the operating side, was for many years a railroad traffic officer, long an executive in commercial industry, during federal control of railways a regional director, identified with company autonomy in railway labor relations, embodies in his leadership the experience of the railway employee, the railway manager as an employer and in contact with the public, the industrial shipper, the government officer and the public spirited citizen.

James A. Emery, counsel of the National Association of Manufacturers, profound student of the social aspects of government regulation, courageous critic of employers and employees in their policies affecting the public, gifted speaker, voices the needs and views of a very large body of business men whom transportation affects on the one hand as shippers and on the other as employers competing with the railways for labor.

George Wharton Pepper, United States senator from Pennsylvania, appointment of whom to that office brought Pennsylvania national congratulations and who in the subsequent primaries against opposition of organized labor and advocates of the veterans' bonus was nominated by more than 200,000 majority, many years a leader in civic, philosophic and athletic activities, eminent orator, brings to our rostrum the impressions of a trained student of government free from the atmosphere which involves senators who participated in the railway legislation of 1920.

"Big Four" No Longer Exists, Says Lee

According to W. G. Lee, of the Brotherhood of Railroad Trainmen, methods of settling wage and working agreements between the "Big Four" transportation brotherhoods and the railroads have entered a new era, and if the present course of negotiations is continued the country for several years at least will not be threatened with a complete tie-up of railroad transportation through a concerted strike of these brotherhoods on all lines of the nation. Decentralization of all wage and working rules negotiations and a return to the system prevailing for twenty years prior to the time when the four train service brotherhoods pooled their strength into what has since become known as the "Big Four" railroad brotherhoods, has already set in, in the view of Mr. Lee, speaking at Cleveland.

The new alinement of the transportation brotherhoods probably will find the Brotherhood of Railroad Trainmen and Order of Railway Conductors in one group, and the Brotherhoods of Locomotive Engineers, Brotherhood of Locomotive Firemen and Enginemen and the Switchmen's Union of North America in another.

"I feel that I am able to handle my organization to better advantage, to get more for my men and to work more effectively all around if the trainmen and conductors go it alone, so far as wages and working rules are concerned," Mr. Lee said.

"This whole business, with all railroad unions on one side and all railroads on the other, with the Railroad Labor Board in between, got too big for any one man or a few men to handle. It was loaded with dynamite for the country as well as for ourselves and the executives. No sane government would permit any fraction or class to paralyze the transportation business of the country and thereby punish the innocent, who are always in the majority. The only way out was to separate." So far as strikes, wages and working rules negotiations are concerned, the "Big Four" no longer exists. The brotherhoods will continue to work together on legislative, non-partisan, political and purely organization matters.

Wage Statistics for July

According to the monthly bulletin of wage statistics issued by the Interstate Commerce Commission, for the month of July, the shopmen's strike was badly broken on July 15, two weeks after it was called. At that date it was only 52 per cent effective from the standpoint both of the number of men employed and the straight time actually worked. Whereas statements by the shopcraft leaders usually referred to the number of men on strike as 400,000, the commission's report says: "Based on the count at middle of month, the number of employees in the maintenance of equipment and stores group as a result of the strike conditions decreased 255,266, or 52 per cent from the number in June, while the total number of hours was 45.4 per cent less. On the other hand, the overtime paid for in this group was more than three times as great in July as in June. The straight time actually worked was 52 per cent less in July than in June."

The report shows a total of 234,837 employees in this group in service at the middle of the month, including 14,088 employed on a daily basis and 220,749 on an hourly basis. The average earnings per employee for the month ranged from $80 for common laborers to $207 for boiler makers. Blacksmiths averaged $155, car men from $141 to $172, electrical workers from $144 to $203, machinists $197, molders $131, sheet metal workers $196. Regular apprentices averaged, however, only $69 and foremen and inspectors in general averaged higher than the classes of employees named. Another change due to the strike is shown in the statement that the police forces were 37,929 greater in July than in June, 1922.

The total number of employees reported by Class I railroads for the month of July shows a net decrease from the previous month of 217,590, or 13 per cent. The increase or decrease (D), by groups, was as follows:

Executives, officials, and staff assistants	372
Professional, clerical, and general	39,526
Maintenance of way and structures	*D*5,583
Maintenance of equipment and stores	*D*255,266
Transportation (other than train, engine, and yard)	5,157
Transportation (yardmasters, switch tenders, and hostlers)	1,315
Transportation (train and engine service)	*D*3,111
Net decrease	*D*217,590

A comparison of the number of employees and their compensation for the month of July, 1922, with the same month last year follows:

	Number of employees	Total compensation
July, 1921	1,634,872	$214,339,385
July, 1922	1,467,824	193,571,244

The Rock Island Celebration

The celebration of the 70th anniversary of the founding of the Chicago, Rock Island & Pacific Railway was carried out at Chicago, Joliet and other places on Tuesday, October 10, in accordance with the previous announcements. A large number of officers of the road, old-timers and friends of the Rock Island gathered at the LaSalle Station, Chicago, in the morning and an hour was spent in greetings, posing for pictures and other holiday activities. The train shed was jammed with the crowd. A holiday spirit permeated the entire Rock Island System. Among the other features at Chicago was a group of girls dressed in gowns similar to those worn by the women who were passengers on the first train which was run on the opening of the first section of the line from Chicago to Joliet, 40 miles.

At ten o'clock, a special train in charge of Charles Hayden,

chairman of the board of directors, was started for Joliet. It was stopped for two minutes at the shops at 47th street, where the shopmen turned out in full force. This train was in charge of five employees whose aggregate service on the road equals 200 years. Among the passengers was a woman who rode on the first train 70 years ago.

At Joliet, the party proceeded to the Court House lawn, where a monument has been erected to Samuel Benedict Reed, the civil engineer who surveyed the route between Chicago and Joilet. The monument was unveiled by Anne Reed Bates, great granddaughter of the surveyor. A dedication speech was delivered by J. E. Gorman, president of the road. Mr. Gorman took occasion to call attention to the danger of super-regulation of the railroads. The anniversary day was brought to a close with the broadcasting of the story by radio from station KYW. This story was again spread throughout the western country, from other stations farther west, and employees and others at various points all over the system were able to listen to the music of the orchestra and parts of the addresses.

Shop Craft Leaders Continue Fight on "Daugherty Injunction"

Two motions, made before Judge James H. Wilkerson of the Federal District Court at Chicago by Donald R. Richberg, attorney for the railroad shopmen in the "Daugherty injunction case," were defeated on October 6, when the court denied Mr. Richberg's motion that the government file a bill of particulars giving details of the charge made against the strikers in affidavits presented to the court, and also refused to issue an order granting Mr. Richberg's request that the case be pronounced one of "extraordinary public interest" so that three judges of the Circuit Court might be assigned to hear it immediately. At the same time Blackburn Esterline, assistant solicitor general, stated on behalf of the government that the court would be asked to refer the hearings in support of the government's plea for a permanent injunction to a master in chancery. Attorney Richberg also filed, on behalf of the defendants in the case, formal denials of the charges made against them in the government's bill. He again declared that the actions of railroad executives were responsible for the strike and that the men had merely walked out to defend their rights.

When Attorney Richberg appeared before the court on October 5 he declared that he had been unable to see Attorney General Daugherty in Washington to present his plea for an early final hearing or a review of the interlocutory injunction handed down by Judge Wilkerson on September 25. In connection with his statement to the court, Mr. Richberg delivered a copy of a letter to Solicitor-General Beck severely criticizing the position of the government attorneys.

After stating delays and disappointments over an appointment with the government attorneys, Mr. Richberg said he had received a letter from the solicitor general asserting the position of the Department of Justice to be as follows:

"1. If it were practicable to have three circuit judges hear the case, that proceeding would not expedite, but delay it.

"2. That the department invites counsel for the defendants to consider agreeing on a statement of facts and asks counsel for the defendants to submit such a statement of facts.

"3. If an agreed statement of facts is not practicable, then two courses are open:

"(a) A stipulation to submit the case on the affidavits with leave to either party to offer additional testimony.

"(b) A trial of the case largely on depositions taken 'throughout the United States' except where a stipulation of facts may dispense with formal proof."

In the letter in reply to Solicitor-General Beck, Mr. Richberg said:

"There are two matters which the defendants desire to have expedited. First, a review of the interlocutory injunction, and, second, a final hearing of the case. Your suggestions affect only the second matter and practically ignore the matter of probably greater importance to the defendants."

The shop crafts' attorney said he would "seek to obtain protection of the rights of the defendants through orders which the court may enter and through procedure which the court may adopt, despite the manifest opposition of the attorney-general to the entry of any order or the adoption of any procedure which will protect the defendants from the abuse of official power."

"The use of the summary equity procedure to obtain a tentative conviction of 400,000 men of criminal conspiracy upon evidence found solely in an undigested mass of ex parte affidavits reeking with hearsay and perjury has been made the means of depriving these men of liberty and property so long as the interlocutory injunction remains in force," his letter said.

"The department threatens to take depositions throughout the United States' and make the burden of defending as oppressive and expensive as possible to the already deeply wronged defendants. As an alternative the department offers that counsel for the defendants may stipulate that the unknown and unexplored 'Mount Everest of evidence' in the form of affidavits, be submitted as though formally taken, or in other words, that we allow the defendants to be found guilty of a criminal conspiracy without opportunity to cross-examine hundreds of witnesses."

Solicitor-General James M. Beck, on behalf of the attorney-general, in a letter to the counsel for the shop unions, suggested that the best method of expediting the case is to follow the course which would permit of a direct appeal to the Supreme Court. This method, he said, would be "to agree upon a statement of facts for submission to the district court, which would eliminate the necessity of proof as to many matters which as matters of fact are indisputable. If you would care to submit to the department, without prejudice, a statement of such facts as you would agree were the facts of the case, the department could then indicate to what extent it was prepared to accept such statement of facts, as the full evidence in the case, or as part thereof. This course might eliminate thousands of pages of testimony which would be for the convenience, not merely of the court, but also of counsel for both parties."

Labor Board Again Rules Against Contracting

On October 7 the Labor Board handed down twelve decisions, all of which involved principles of contracting. Nine of the decisions condemned this practice, while one favored it. In all of the cases decided unfavorably to the railroad contentions, the Board referred to its decision in a similar case involving the Indiana Harbor Belt and published in the *Railway Age* of May 13, page 1111. The disputes so decided in this latest group of decisions involved the following carriers, contracting companies and facilities:

The Erie and the Meadville Machinery Company for the operation of shops at Dayton, Sharon, Meadville, Hammond, Huntington, Marion, Rochester, Avon, Elmira, Cleveland, Binghamton, Galion, Dunmore, Avoca and Stroudsburg.

The Cincinnati, Indianapolis & Western and the Kellogg-Grego Railway Service Company.

The Cincinnati, Indianapolis & Western for the contracting of certain clerical and station work.

The Pere Marquette and the Fort Street Union Depot for the contracting of the power plant and facilities at Baldwin, Mich.

The Cleveland, Cincinnati, Chicago & St. Louis and the Railway Service & Supply Corporation for the contracting of freight car repair shops at Brightwood and Beach Grove, Ind., and the locomotive repair shops at the latter point.

The Bangor & Aroostook for the contracting of its shops at Houlton, Maine.

The Chicago, Rock Island & Pacific for contracting of coal chutes at Cortland, Kan., Fairbury, Neb., and Lincoln, and a pumping station at South Bend, Neb.

The Michigan Central and the Illinois Car & Manufacturing Company for the contracting of the car shops at West Detroit, Mich.

The Chicago & Alton and Joseph Colianni & Bros. for the handling of coal, sand and cinders and for the pumping of water along its lines.

A dispute involving the New York Central and the Railways Employees Department of the American Federation of Labor, the hearings in which were described in the *Railway Age* of September 17, 1921, page 541, was decided by the board in favor of the New York Central. Contracts entered into by that carrier with the Western Union for the purpose of constructing and maintaining telegraph lines along the New York Central right of way were declared legal by the board inasmuch as they were made in the public interest and the practice had been in effect prior to the passage of the Transportation Act.

Several alleged disputes over the practice of contracting were

at the same time dismissed by the board. Among the cases of this character being two involving the Ann Arbor and one involving the Southern Pacific, Texas & Louisiana lines.

Railway Returns for August Show Effect of Strikes and Rate Reduction

The net operating income of the Class I railroads totaled $2,579,799 in August, according to reports filed with the Interstate Commerce Commission. This represented a return, on an annual basis, of only 2.65 per cent of their tentative valuation, the lowest since May, 1921. In August last year the net operating income totaled $90,160,200, which was at the annual rate of return of 4.54 per cent, while in July this year it was $69,239,000, or 4.04 per cent.

The railroads fell short $61,689,500 of a return of 5¾ per cent.

Operating revenues were $473,877,000, a decrease of 6.3 per cent compared with the same month last year, while the operating expenses amounted to $387,150,000, an increase of 1.3 per cent. Factors affecting this decrease in revenues and the increase in expenses were the coal miners' and railroad shopmen's strikes and the decrease of approximately 10 per cent in freight rates made effective on July 1.

During the first eight months this year the net operating income was $471,183,600, compared with $306,063,600 during the corresponding period last year. This is at the annual rate of return of 4.07 per cent on the tentative valuation, compared with 2.64 per cent during the first eight months in 1921. Operating revenues for the eight months totaled $3,528,502,000, a decrease of 3.2 per cent, while the operating expenses totaled $2,806,501,600, a decrease of 9.7 per cent.

The carriers in the Eastern district had a net operating income in August of $14,929,990, compared with $35,402,300 during the same month last year. The operating revenues were $227,016,000, a decrease of 4.9 per cent, while the operating expenses amounted to $196,821,900, or an increase of 4.3 per cent.

The railroads in the Southern district had a net operating income in August of $4,618,000, compared with $4,422,000 during the same month last year. The operating revenues totaled $54,321,300, or a decrease of 2.4 per cent, while the operating expenses totaled $46,083,000, or 4.6 per cent under those of August last year.

Carriers in the Western district had a net operating income in August of $33,031,700 compared with $50,335,500 in August last year. The operating revenues for those roads totaled $192,539,300, a reduction of 8.9 per cent, while their operating expenses amounted to $144,245,000, a reduction of ½ of 1 per cent under August one year ago.

Forty-nine roads in August had operating deficits. Of this number 28 were in the Eastern district, 8 in the Southern and 13 in the Western district. In July, 47 had operating deficits.

P. & A. Photo

Anthracite Miners at Nanticoke, Pa., Returning to Work

Traffic News

The Interstate Commerce Commission has assigned the interchangeable mileage book case for oral argument before the full commission at Washington on November 15.

A total of 98,223 travelers visited Yellowstone National Park this year as compared with 81,656 in 1921. Of this number 33,588 persons traveled by railroad to the park's entrance.

F. H. Baer, traffic commissioner of the Cleveland, Ohio, Chamber of Commerce, has been temporarily appointed director of transportation of the Ohio State Fuel Administration, with headquarters at Columbus, Ohio.

The steel mills in Pittsburgh and vicinity report serious congestion because of lack of cars, and at the end of last week, according to newspaper reports, the Carnegie Steel Company had 100,000 tons of finished and semi-finished steel piled up.

The Boston Chamber of Commerce is complaining to the Interstate Commerce Commission alleging lack of cars for the movement of flour and grain eastward, and the Commission is requested to see that export trade in these products is not favored to the detriment of domestic consignees.

The coal situation at New York City has been complicated by the presence in the yards on the New Jersey side of the River of large quantities of anthracite, of small sizes, which cannot be disposed of. At the end of last week, it was said that the total number of these cars loaded in all of the yards was 3,500. It appears that the owners expected to sell this coal largely to owners of apartment houses and to manufacturers; but some of these parties have bought bituminous coal from England and others are apparently waiting for a fall in the price.

The Illinois Central's "Hotel On Wheels," which was so popular at the Knights Templar Conclave held in New Orleans, last April, will be re-established for the American Legion convention to be held in the same city on October 16-20, inclusive. At the time of the Knights Templar Conclave, 2,500 persons were housed in parked Pullman cars, 3,211 meals were served in the Illinois Central dining cars, 1,185 shower baths were provided for and a club house, laundry facilities, barber shop and other comforts were placed at the disposal of the patrons. Present indications are that there will be a demand for a great many more cars for the American Legion than the 125 sleeping cars used in April.

Coal Supplies in Hands of Consumers

As a part of its campaign to stabilize the fuel situation through co-operative effort between the government and business, the Chamber of Commerce of the United States has made a survey of coal supplies in the states east of the Mississippi and north of the Ohio rivers. This part of the country has been regarded as the critical territory in the event of a coal shortage this winter. The information gathered by the Chamber which was obtained through local chambers of commerce, was summarized as follows:

"There are practically no supplies in the hands of local dealers.

"Public utilities, about 45 days.

"By-product coke plants fairly well supplied.

"Steel works fairly well supplied.

"General industries about 45 days.

"The bituminous situation is becoming easier.

"There seems to be no general complaint as to price.

"The critical situation is that of securing sufficient domestic supply in advance of cold weather, especially for the Great Lake states and the populous areas of New York State, New England and the central Atlantic states.

"There is much interest being taken in the use of oil.

"There is a general increase in the use of coke for domestic fuel.

"Certain cities have very effective systems of gathering information and distributing their coal, while others have nothing."

Commission and Court News

Interstate Commerce Commission

The commission has suspended from October 10 until February 7, 1923, the operation of schedules published in supplements to B. T. Jones' tariffs, which propose to either cancel or increase proportional rates on petroleum and petroleum products between Chicago, Ill., and Mississippi and Ohio river crossings on the one hand and points in Central Freight Association, Trunk Line and New England Freight Association territories on the other.

The commission has suspended until February 5, the operation of certain schedules published in supplements to Agent F. A. Leland's tariff which propose to establish reduced proportional rates from Beaumont-Port Arthur-Houston groups, applicable on petroleum and its products (except crude and fuel oil) of 14 cents per 100 lb., and on crude and fuel oil 12½ cents to New Orleans, when final destination is in states other than Alabama, Florida, Georgia, Mississippi, North Carolina and South Carolina, also to establish joint rates from the same groups to points in Western Trunk Line and Central Freight Association Territories.

Court News

Damages to Live Stock Attributed to Inherent Nature

Where it is shown that no injury could have occurred to live stock, received by the carrier in good condition, and properly loaded, from negligence in transportation, but some of the stock are dead on arrival at destination, the West Virginia Supreme Court holds that such result will be attributed to the inherent nature or propensities of the animals, and not to the negligence of the carrier.—Talbott v. Payne (W. Va.) 111 S. E. 328.

Right to Require Change in Railroad Bridges

The Circuit Court of Appeals, Seventh Circuit, holds that the fact that land owners constructed an artificial channel under a bridge built by a railroad company and maintained the channel for more than 20 years gave them no right to require the bridge to be altered and nothing more than a prescriptive right to the use of the channel in its existing condition.—Hines v. Woodson, 280 Fed. 966.

Right to Use Other Railroad's Right of Way Held to Include Right to Install Siding

Where a railroad had the right under its charter to maintain an independent track over another railroad's right of way under proper regulations of such other railroad, the Vermont Supreme Court holds that it could install a siding provided that would not give it an unreasonable advantage over the other railroad and was necessary for the proper use of its own rights.—D. & H. v. Rutland (Vt.) 116 Atl. 211.

Injury to Passenger's Fingers in Door Jamb

The Kansas Supreme Court holds that a railroad is not liable for injuries to a passenger of mature years who in the act of leaving the car places her fingers in the door jamb and the door is blown shut by a gust of wind, when she knew that the door was not fastened, and knew it had been swinging freely "all the time" during her journey of 65 miles. —Brehm v. Atchison, T. & S. P. (Kan.), 206 Pac. 868.

Discontinuance of Branch Line Justified

The Mississippi Supreme Court holds that where it is clear from the evidence that there is no public need to be served by the reconstruction of an abandoned branch line, and no reasonable expectation of present or prospective traffic which would justify the expenditure for its construction, equipment and operation, denial of mandamus to keep the track in operation is proper.—State ex rel. Collins v. Leland Southwestern (Miss.) 91 So. 7.

Not Liable for Delay in Delivery Caused by Strikes

The Maine Supreme Court holds that a carrier is not liable for delay in delivery due to strikes where it has exercised reasonable diligence to prevent them and minimize their consequences. While a master is responsible for the acts of its employee within the scope of his employment, an employee ceases to be such when he strikes. The court points out that some authorities distinguish between peaceable strikes and strikes accompanied by violence.—Warren v. Portland Terminal Co. (Me.) 116 Atl. 411.

"Interstate Shipment" Within Federal Larceny Statute

The Circuit Court of Appeals, Second Circuit, holds that a shipment originating in one state and consigned to a point in the same state, but moving in its course through another state is interstate commerce within the meaning of Act of Congress, Feb. 13, 1913, providing for punishment for larceny of goods in interstate commerce. Such a shipment has become subject to different jurisdictions in the course of transportation, and this makes federal control practically necessary, as well as legally possible.—Yohn v. U. S., 280 Fed. 511.

Not Liable if Passenger Negligently Misuses Step Box

The Louisiana Supreme Court holds that where a carrier of passengers furnishes a step box, it is bound to see that it is safe as to strength, so constructed as not to be easily overturned, is kept in proper condition, and when set out for use by passengers is placed on a level and stable surface; but the carrier is not the insurer of the passenger against the consequences of his own negligence, and where the passenger is injured in attempting to use such appliance without looking at it, and stumbles over or against it when he should have stepped on it, his injuries are attributable to his misuse of the appliance and not to its inadequacy, and the carrier is not liable for the injuries.—Scott v. V. S. & P. (La.) 90 So. 840.

Time Limit on Complaints of Overcharge

The Supreme Court of the State of Washington holds that the provision of the Federal Transportation Act that the period of Federal control shall not be computed as part of the periods of limitation in actions against a carrier or claims for reparation to the commission for causes of action arising prior to Federal control, applies only to the Federal rate regulating statutes, and has no effect on a state statute requiring complaints of overcharges to be filed with the state Public Service Commission within two years from the accrual of the cause of action, and failure to file within that time will bar recovery.—Northern Pacific v. Department of Public Works (Wash.), 207 Pac. 686.

Decisions Under Federal Employers' Liability Act

The New Hampshire Supreme Court holds that an employee engaged in repairing the track of an interstate railroad was within the act.—McLean v. Boston & Maine (N. H.) 116 Atl. 435.

The Mississippi Supreme Court holds that an employee injured while repairing an interstate locomotive dismantled and undergoing general repairs, and out of service several weeks before and after the injury, was not within the act.—New Orleans & Northeastern v. Beard (Miss.) 90 So. 727.

The Minnesota Supreme Court holds that persons engaged in emptying a cinder pit used for cinders from engines engaged both in interstate and intrastate commerce should be held to be employed in interstate commerce.—Stavros v. Chicago, M. & St. P. (Minn.) 186 N. W. 942.

The New York Appellate Division holds that a laborer in a repair and construction gang, about to commence work on an uncompleted facility which would not engage in interstate commerce until completed, i. e., a crossover track, was not engaged in interstate commerce.—Otterstedt v. Lehigh & Hudson, 193 N. Y. Supp. 104.

Foreign Railway News

Mexican National Railways to be Returned to Owners

The Mexican National Railways will be returned to their owners not later than November 15 according to a Mexico City dispatch to the Wall Street Journal. The announcement was reported to have been made by the Mexican treasury department.

New Station at Tampico, Mexico

It has been announced at Tampico that government approval has been given the plans and specifications for the proposed new passenger station of the National Railways of Mexico at Tampico, which plans were drawn by J. Montanez, terminal engineer. The building will cost approximately $500,000 United States currency. It is stated, however, that on account of the financial stringency it is probable that the erection of the station will not be started until the early part of next year.

Prospective Large Equipment Inquiry from Argentina

The La Plata Meridiano Railway, owned and operated by the Province of Buenos Aires, Argentina, has been authorized to construct and equip 650 kilometers of new lines provided proper financial arrangements can be made, according to a cablegram received by the Bureau of Foreign and Domestic Commerce. Originally bids were to be opened October 31, but the date has been put off to December 31. Some of the equipment includes 44,300 tons of 31 kg. rails; 470, 30-ton covered-goods wagons; 30, 30-ton open-goods wagons; 50, 30-ton flat cars; 130, 30-ton cattle cars; 27 Pacific type locomotives; 10 first class, American type passenger cars; 10 second class, American type passenger cars; 39 baggage cars; machinery to equip the shops and numerous miscellaneous items.

Southern Pacific Improves Line in Mexico

Permanent bridges are being built on the line of the Southern Pacific Railroad of Mexico to replace the temporary structures that were erected to meet emergencies during the destructive revolutionary period. It is stated that the Southern Pacific has made a formal offer to the Mexican Government to accept bonds to cover the $12,000,000, United States currency, claim which it holds against the government for losses and damages to its property at the hands of revolutionists. The line all the way from Nogales, Ariz., to Tepic is being placed in first class condition and a gratifying increase of traffic has taken place during the last few months. It is authoritatively announced that the Southern Pacific has not abandoned its original plans for the construction of an extension of its line from Tepic to a connection with the National Railways of Mexico at Orendain, near Guadalajara. It is not known, however, just how soon work will be resumed on this project. It involves the construction of several tunnels and much other heavy work.

South Manchuria Railway Plans Improvement

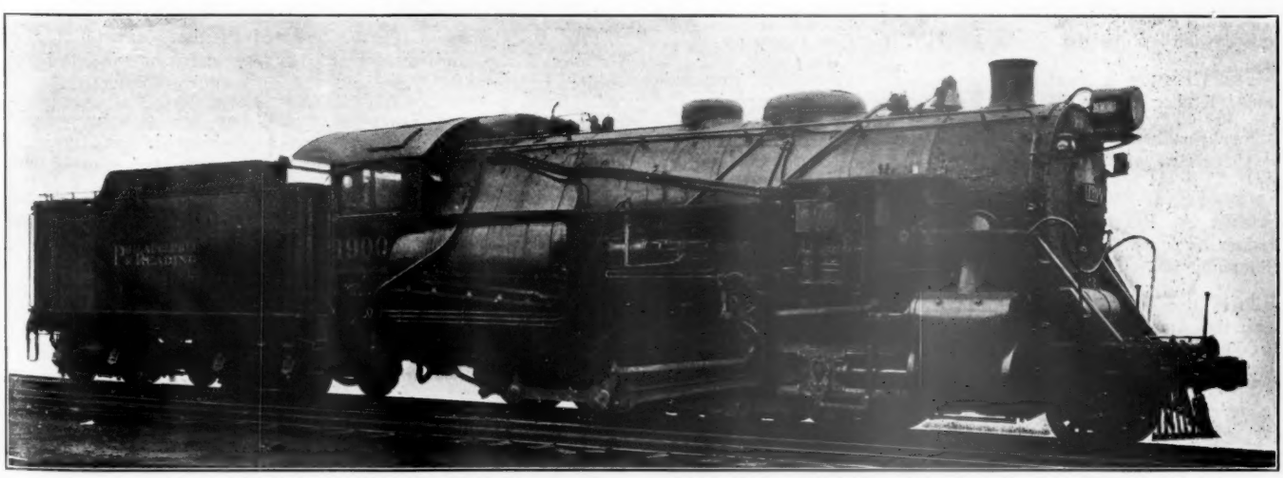
For the fiscal year ending March 31, 1923, the South Manchuria Railway has appropriated $4,061,910 to be devoted to railway improvements and construction, according to recent information from the company, according to Consul J. W. Ballantine at Dairen.

The double-tracking of the line with 100-pound rails between Tiehling and Chungku, between Chuantu and Shwangmiaotze, and between Wuchiatun and Suchiatun will be continued, and the type of rails used in the Dairen wharf inclosure will be changed.

At Mukden station a roofed-in passenger platform will be constructed and additional sheeting will be purchased to protect against moisture in connection with the equipment for mixed storage of beans. On the line between Mukden and Suchiatun, an automatic signal system will be installed. The building of additional freight locomotives, reconstruction of rolling stock of all types, and the finishing of 9 freight locomotives and 20 freight cars begun during the previous fiscal year complete the program.

To Electrify Portion of Mexican Railway

Information has been received that at the recent annual meeting of the shareholders of the Mexican (Vera Cruz) Railway Company, held in London, England, provision was made for electrifying the thirty miles of mountain division of the road between Orizaba and Esperanza. The announcement of the proposed improvement came from Vincent W. Yorke, of London, chairman of the board of directors. The electric power for operating trains on this portion of the line will be obtained either from the hydroelectric plant of Lord Cowdray and associates situated near Orizaba or an entirely separate plant will be built by the railroad, it is stated. Mr. Yorke further said that at the shareholders meeting the action of the Mexican (Vera Cruz) Railway Company is obtaining a concession for a proposed railroad to run from a point on its Mexico City-Vera Cruz main line to Tampico was ratified and that financial provision for the early construction of this new line has been made. He announced that the cost of its construction would be approximately $8,000,000 United States currency.



New Philadelphia & Reading Consolidation Type Locomotive

These locomotives have driving wheels 55½ in. in diameter, carry 210 lb. steam pressure and exert a maximum tractive force of 64,300 lb. The total weight of engine and tender is 467,000 lb. Twenty-five locomotives of this design are being built by the Baldwin Locomotives Works.

Equipment and Supplies

Locomotives

THE PERE MARQUETTE is inquiring for 22, 8-wheel switching locomotives.

THE PENNSYLVANIA will build 3 electric locomotives in its Altoona shops.

THE SOUTHERN PACIFIC, TEXAS LINES, is inquiring for 9 Pacific type locomotives.

THE CENTRAL OF NEW JERSEY is inquiring for from 5 to 10 Mikado type locomotives and expects to order additional motive power later.

THE UNITED FRUIT COMPANY has ordered one Mikado type and one 6-wheel switching locomotive from the Baldwin Locomotive Works.

THE TIMISKAMING & NORTHERN ONTARIO has placed an order with the Canadian Locomotive Company for rebuilding and repairing 6 locomotives.

THE LEHIGH VALLEY, reported in the *Railway Age* of September 23 as inquiring for 25 Mikado type locomotives, has ordered 15 Mikado type from the American Locomotive Company and 15 Mikado type from the Baldwin Locomotive Works

Freight Cars

THE PENNSYLVANIA will build 100 steel caboose cars in its Altoona shops.

THE CENTRAL OF GEORGIA is inquiring for 10 steel underframes for caboose cars.

THE PERE MARQUETTE expects to come in the market soon for 2,000 cars, including 1,500 box cars.

THE CHICAGO GREAT WESTERN has awarded a contract to the Pullman Company for 500 box cars.

THE NORFOLK SOUTHERN has ordered 240 steel underframes from the Virginia Bridge & Iron Company.

THE UNITED FRUIT COMPANY has ordered from the Magor Car Corporation 25 cane cars for the Tela Railroad.

THE INTERSTATE RAILROAD has ordered 1,000 box cars of 55 tons' capacity from the Pressed Steel Car Company.

F. M. PEASE, Chicago, Ill., has ordered 100 tank cars of 8,000 gal. capacity from the Pennsylvania Tank Car Company.

THE CHICAGO & NORTH WESTERN will receive sealed proposals until October 20 for 800 steel ore cars of 50 tons' capacity.

THE GRAND TRUNK is having repairs made to 1,000 box cars at the shops of the National Steel Car Corporation, Hamilton, Ont.

JOHN A. ROEBLING'S SONS, Trenton, N. J., have ordered 2 hopper cars of 55 tons' capacity from the Pressed Steel Car Company.

THE OLD TIME MOLASSES COMPANY, INC., has placed an order with the American Car & Foundry Company for 72 tank cars of 10,000 gal. capacity.

THE EAST JERSEY RAILROAD & TERMINAL COMPANY has placed an order with the American Car & Foundry Company for 25 tank cars of 10,000 gal. capacity.

THE UNION PACIFIC was erroneously reported in the *Railway Age* of September 30 as having placed an order with the Mount Vernon Car Manufacturing Company for 50 caboose cars. The inquiry for this equipment has been postponed indefinitely.

THE SINCLAIR REFINING COMPANY, Chicago, has ordered 5 tank cars of 6,000 gal. capacity and 5 of 8,000 gal. capacity from the American Car & Foundry Company.

THE TRANSCONTINENTAL OIL COMPANY has placed an order with the American Car & Foundry Company for 75 tank cars of 8,000 gal. capacity and 75 of 10,000 gal. capacity.

THE FRUIT GROWERS' EXPRESS, reported in the *Railway Age* of August 5 as inquiring for 1,000 refrigerator cars, will build these cars in its own shows at Indiana Harbor, Ind.

THE FRUIT GROWERS EXPRESS, reported in the *Railway Age* of September 23 as inquiring for 1,000 steel underframes, has ordered this equipment from the American Car & Foundry Company.

THE NEW YORK, CHICAGO & ST. LOUIS, reported in the *Railway Age* of September 23 as inquiring for steel underframes has ordered 300 steel underframes for stock cars from the Illinois Car Manufacturing Company.

THE BETHLEHEM-CHILE IRON MINES COMPANY, reported in the *Railway Age* of September 16 as inquiring for 20 ore cars has ordered 25 hopper bottom ore cars of 50 tons' capacity from the Magor Car Corporation.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of September 23 as contemplating the purchase of 500 box cars, 500 coal cars, 500 automobile cars, 250 flat cars, 250 ballast cars, 250 refrigerator cars and 250 stock cars, has now issued inquiries for these cars.

THE DETROIT TOLEDO & IRONTON reported in the *Railway Age* of September 30 as inquiring for 500 to 1,000 coal cars has ordered this equipment from some company who will lease it a number of such cars until the new cars are constructed. It is reported that the Cambria Steel Company received this contract.

THE ATCHISON, TOPEKA & SANTA FE, reported in the *Railway Age* of October 7 as about to place orders for 2,000 refrigerator cars of 40 tons' capacity, 1,000 automobile cars of 40 tons' capacity, 500 double deck stock cars of 40 tons' capacity, 1,000 box cars of 40 tons' capacity and 500 cars of 50 tons' capacity, has ordered this equipment as follows: 1,000 refrigerator cars, 1,000 automobile cars, and 500 stock cars to the Pullman Company; 1,000 refrigerator cars, 500 gondola cars and 500 box cars to the American Car & Foundry Company and 500 box cars to the Standard Steel Car Company. This company reported in the same issue as having placed an order for 50 caboose cars to the American Car & Foundry Company has increased this order to 150 caboose cars from the same company.

Passenger Cars

THE CHICAGO & NORTH WESTERN is inquiring for 36 coaches, 10 baggage cars, 2 dining cars and 2 cafe parlor cars.

THE BALTIMORE & OHIO, reported in the *Railway Age* of October 7 as inquiring for 30 baggage cars, has ordered this equipment from the American Car & Foundry Company.

THE CENTRAL OF NEW JERSEY will buy new passenger equipment, to include 50 coaches, 5 steel combination passenger and baggage cars and 10 steel combination baggage and express cars.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of September 23 as contemplating issuing inquiries soon for 50 all steel suburban passenger cars, is now inquiring for 50, 70 ft. steel suburban cars.

Iron and Steel

THE WABASH has ordered 15,000 tons of rails

THE MISSOURI PACIFIC has ordered 15,000 tons of rail.

THE ANN ARBOR RAILROAD has ordered 3,000 tons of rail from the Midvale Steel & Ordnance Company.

THE TOLEDO, ST. LOUIS & WESTERN has placed an order for 8,000 tons of rail with the Carnegie Steel Company.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 35,000 tons of rail from the Illinois Steel Company and 5,000 tons from the Inland Steel Company.

THE PHILADELPHIA & READING has placed orders for 25,000 tons of 100 and 130-lb. rail with the Bethlehem Steel Company, Carnegie Steel Company and the Cambria Steel Company.

THE MISSOURI, KANSAS & TEXAS, reported in the *Railway Age* of September 30 as inquiring for 10,000 tons of steel rail, has ordered this tonnage from the Illinois Steel Company.

THE CHICAGO, MILWAUKEE & ST. PAUL is reported to have purchased 40,000 tons of steel rail from the Illinois Steel Company and 10,000 tons from the Inland Steel Company.

THE NEW YORK, CHICAGO & ST. LOUIS has placed an order for 19,000 tons of rail, divided between Carnegie Steel Company, the Lackawanna Steel Company and the Inland Steel Company.

THE CHICAGO, BURLINGTON & QUINCY, reported in the *Railway Age* of October 7 to have ordered 15,000 tons of steel from the Illinois Steel Company, is reported also to have ordered 15,000 tons from the Colorado Fuel and Iron Company and 4,000 tons from Inland Steel Company.

Track Specialties

THE MISSOURI PACIFIC is inquiring for 3,000 tons of tie plates.

THE NORFOLK & WESTERN is inquiring for 17,000 kegs of track spikes and 12,000 kegs of track bolts.

THE UNION PACIFIC is inquiring for 7,000 tons of tie plates, 10,000 kegs of track spikes and 8,000 kegs of track bolts.

THE MISSOURI, KANSAS & TEXAS is inquiring for 3,000 tons of tie plates, 2,000 kegs of track bolts and 4,500 kegs of spikes.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS is expected to place an order this week for 2,500 tons of tie plates and 5,000 kegs of track spikes. The company is also inquiring for 1,250,000 bolts.

Machinery and Tools

THE VIRGINIAN RAILWAY is inquiring for some shop tools including a gap lathe and an engine lathe.

Miscellaneous

THE IMPERIAL JAPANESE GOVERNMENT RAILWAYS have ordered 33,000 car couplers from the American Steel Foundries.

THE ERIE has awarded a contract to the Truscon Steel Company, Youngstown, Ohio, for the sash required in the construction of its new machine shop at Hornell, New York.

THE CHICAGO, BURLINGTON & QUINCY, reported in the *Railway Age* of September 16 as inquiring for 7 overhead electric cranes for its new shops at Denver, Colo., and for 2 gantry cranes for its scrap yard near Aurora, Ill., has ordered this equipment from the Pawling & Harnischfeger Company, Milwaukee, Wis.

Signaling

THE NEW YORK CENTRAL has ordered from the Hall Switch & Signal Company 88 semaphore signals, style L; 542 relays; 401 switch boxes and other signal apparatus.

THE ILLINOIS CENTRAL has ordered from the Hall Switch & Signal Company 15 color-light signals. These with a previous order, will make a total of 69 light signals furnished by the Hall Company to the Illinois Central.

THE GOVERNMENT OF JAPAN has ordered for the Imperial Government Railways from the Union Switch & Signal Company, 275 automatic block signals, of which about half are semaphore and half color-light. The order includes 860 relays, 450 track transformers and other apparatus.

Supply Trade News

The Par-Kar Coach Company, St. Louis, Mich., has been incorporated recently to manufacture motor parlor equipment.

E. S. Berry, until recently with the New York Central and formerly with the **Hall Switch & Signal Company**, Garwood, N. J., has re-entered the service of the latter company as sales engineer.

W. S. Murrian & Co., Knoxville, Tenn., is the southern district representative of the **Flannery Bolt Company**, Pittsburg, Pa. In the *Railway Age* of September 9 it was incorrectly reported that W. S. Murrian & Co. was the representative of the American Flexible Bolt Company.

The Federal Trade Commission has announced the dismissal of its complaint against the Midvale Steel & Ordnance Company, Republic Iron & Steel Company, and Inland Steel Company, in which it was alleged that the proposed merger of the companies was an unfair method of competition. The complaint was dismissed upon the filing with the commission of a formal statement by attorneys of record for the three companies, that the merger had been abandoned.

Charles E. Fisher, assistant engineer, test department, New York, New Haven & Hartford R. R., has been appointed service engineer of the **Franklin Railway Supply Company**, New York, in charge of New England territory, with headquarters at Boston, Mass. After graduation from the University of Michigan, Mr. Fisher served the Pennsylvania Railroad in various capacities for three and one-half years. He then joined the Midvale Steel & Ordnance Company in its material department. While in that position, he was called to Rochester by the Signal Corps and later assigned to the Bureau of Aircraft of the U. S. Government, in which branch of the service he had charge of inspection of all material supplied to the government in that district. Upon completion of the government work, Mr. Fisher entered the service of the New York, New Haven & Hartford in its department of tests and from there went to the Franklin Railway Supply Company.

E. deH. Caldwell on September 1, joined the staff of the **Franklin Railway Supply Company**, New York, as special engineer in its service department. Mr. Caldwell began his railroad service with the Aurora, Elgin & Chicago Electric Railway Company, and from there entered the service of the White Company as superintendent of repairs, in which position he had an active part in the design of steam operated automobiles. After five years in that work, he devoted the next five years as chief engineer of the Webb Jay Motor Company in the design of steam automobile engines. For the next seven years he was vice-president and chief engineer of the Empire Axle Company, following which he served for one year as chief engineer of the Hammond Steel Company, with which organization he was connected at the time of entering the service of the Franklin Railway Supply Company.

E. G. Grace, president of the **Bethlehem Steel Corporation**, stated that the meeting of the board of directors held September 10 was for the purpose of taking final action on formal matters with respect to the Lackawanna purchase. The transaction was completed by delivery on the part of the Lackawanna Company of all instruments for passing title to all its properties and the delivery on the part of Bethlehem to the Lackawanna Company of the Bethlehem stock and cash agreed to be paid therefor. The Lackawanna Company is arranging for the delivery to its stockholders of their pro rata part of the Bethlehem stock and cash upon surrender of the stock of Lackawanna Steel Company held by such stockholders. The exchange is to be made at the office of Kean, Taylor & Company, 5 Nassau street, New York City, and it is expected that it will begin about October 27. All corporate proceedings for the dissolution of the Lackawanna Company have been taken and the dissolution papers are being filed.

President Grace emphatically denies recent rumors to the effect that the Bethlehem Company is considering the purchase of the Midvale Steel Company.

The Atlas Steel Corporation, Dunkirk, N. Y., was organized on October 2, as the result of a merger between the Youngstown Electric Alloy Steel Company, Youngstown, Ohio, and the Atlas Crucible Steel Company, Dunkirk, N. Y. Louis J. Campbell, a former vice-president of the Youngstown Sheet & Tube Company, was elected chairman of the board of directors and will be the active directing head of the corporation. On the board of trustees will be James A. Campbell and H. G. Dalton of Cleveland, Ohio, a vice-president of the Youngstown Sheet & Tube Company; John L. O'Brien of Buffalo, N. Y., and H. F. Van Der Voort of Dunkirk. Of the 20 directors of the new corporation, 12 are well-known Youngstown industrial and financial men, or men connected with the steel industry of the Mahoning Valley, who were members of the board of directors of the Electric Alloy Steel Company. They are: J. A. Campbell, L. J. Campbell, T. J. Bray, W. A. Thomas, Charles S. Thomas, Jonathan Warner, L. A. Manchester, Maurice Joseph, S. Livingston Mather, A. E. Adams, S. P. Ker and W. D. Myers. The other directors include Arthur H. Hunter, R. L. O'Brien, and J. F. Carter of Buffalo; H. F. Van Der Voort, R. J. Gross and H. G. Nichols of Dunkirk, and G. A. Colton and E. B. Green of Cleveland. These men were members of the directorate of the Atlas Crucible Steel Company. The officers of the corporation are: Arthur H. Hunter, president; J. H. Roberts, vice-president; W. D. Myers, secretary and assistant treasurer, and H. G. Nichols, treasurer and assistant secretary. Mr. Roberts was assistant to Mr. Campbell in the Electric Alloy Steel organization, while Mr. Myers was secretary and treasurer of the same company. Both these officers moved with Mr. Campbell to Dunkirk. Reorganization of the entire operating and sales force of the two concerns is now in process.

Pullman Company Issues Annual Statement

The net surplus of the Pullman Company for the fiscal year ending July 31, 1922, was $1,171,294. There was a deficit from the year's operations of $6,228,073, but the balance of the amount received from the government in settlement of claims for the period of federal control ($7,399,367) resulted in a net surplus for the year. President E. F. Carry, in his remarks to the stockholders, states:

Travel, due to various causes, was at a minimum and it was not until the last few months of our fiscal year that it showed signs of improvement in response to seasonal reductions in railroad passenger rates. This improvement, however, has been halted by the discouragement of travel incident to the shopmen's strike commencing July 1. Acting under authority granted by stockholders at a meeting held on December 20, 1921, your company took over the assets and business of the Haskell & Barker Car Company, Incorporated, as of January 16, 1922, and the position of your company has been strengthened by the acquisition of the malleable foundry, wheel foundry, brass foundry and other manufacturing facilities of the Haskell & Barker plant. To complete this purchase, the capital stock of The Pullman Company was increased by $15,000,000, bringing the present capitalization of the company up to $135,000,000. At the close of the year, July 31, 1922, your company owned 7,674 cars, 202 old cars having been scrapped or sold and 126 new cars having been added to the equipment during the year.

While the purchase of equipment by the railroads during the year far exceeded buying during the last few years, it did not approach normal. Scarcity of labor and materials made manufacturing conditions very unsatisfactory. The coal strike seriously interfered with procurement of materials, and on the whole the year from a manufacturing point of view has been a most aggravating one. Your company has orders for freight and passenger cars sufficient to keep it busy until the development of the new busying movement which is expected to follow the removal of uncertainties produced by the coal strike and railroad strike. There is still a great deficit in railroad equipment which must be supplied before the normal business requirements of the country can be met.

Notwithstanding your company had a definite agreement with its employees in repair shops and cleaning yards, providing for arbitration of all disputes on working conditions, on July 1, a considerable number of employees in these departments, without warning and in violation of their agreement with the company, quit their positions in accordance with the general strike call of the shop craft unions. This walkout occurred in spite of the fact that your company did not cut wages, nor did the company in any way change the conditions under which these employees were working. Your company quickly recruited its forces and has been able to operate efficiently and without interruption.

It is believed that with a settlement of the present labor disturbances and a return to more normal conditions in this country, there will be a large increase in passenger travel and a revival of car-building, which will result in a satisfactory improvement in the business of your company.

The income account for the fiscal year ending July 31, 1922, follows:

Revenue		
Earnings from cars	$62,548,406	
Returns from manufacturing, interest, etc.	3,944,631	
		$66,493,037
Expenses		
Operating expenses, repairs of cars, taxes, insurance, etc.	$55,182,022	
Depreciation on cars, etc.	7,039,248	
		$62,221,270
Net income		$4,271,767
Dividends declared		10,499,840
Deficit from this year's operations after payment of dividends		$6,228,073
Balance of amount received from the United States Railroad Administration in settlement of claim for period of Federal control		7,399,367
Net surplus for the year		$1,171,294

Obituary

Allen Sheldon, one of the Chicago representatives of the Gold Car Heating & Lighting Company, Brooklyn, N. Y., died at his home in Chicago on September 27.

E. B. Tyler, vice-president of the Mississippi Valley Structural Steel Company, and one of the founders of the Decatur Bridge Company, died suddenly of heart trouble in St. Louis on September 27.

Marcellus Lester Bailey, treasurer of the Union Manufacturing Company, New Britain, Conn., died on September 26. He had been connected with the company for more than 45 years, and a director and treasurer for 35 years.

John Francis Harrigan, vice-president of the Magnus Company, Inc., New York, died on October 1 at his home in Detroit, Mich. Mr. Harrigan was 54 years old and had been connected with the Magnus Company in Detroit continuously since 1885.

Trade Publications

Lighting System Maintenance.—A 12-page pamphlet under the title of "Lamp Maintenance Equipment" has been issued by the Thompson Electric Company, Cleveland, Ohio. The booklet illustrates and describes the safety disconnecting hangers manufactured by this company, including methods of wiring and the application of various types of reflectors. The reasons for cleaning reflectors and the risks which may be involved in doing so are described and particular stress is laid to the suitability of the hanger where the lighting units are placed close to moving belts or above traveling cranes.

Control, Signaling and Alarm Instruments.—The Brown Instrument Company, Philadelphia, Pa., has issued a 24-page booklet describing and illustrating the automatic control, signaling and alarm instruments manufactured by that company. The catalogue covers a control pyrometer as applied to electric, gas and oil furnaces, indicating control thermometers, a recording control thermometer, a recording pyrometer, a signaling pyrometer which shows by means of lights when the temperature is within certain prescribed limits, an alarm thermometer, control relays and a motor operated control valve.

There's a Lot of Freight to Move—Let's Move It. This is the title of a leaflet which has been issued by W. D. Beck, superintendent of car service of the Chicago & North Western, for both shippers and employees. Attention is called to the fact that the railroads want cars, not demurrage. Superintendents are urged not to "leave it all to the train dispatcher, the agent, or the conductor; try to dig up at least one car every day that otherwise would have remained idle.

"They are also urged to check on-hand reports personally, once a week; also to see that all cars are being loaded full. All employees are urged to watch the cross haul of empties. "Don't pass up these cases, when you see them; but consider that it is your business, and then direct the attention of the proper officer to the condition. * * *."

Railway Construction

CANADIAN PACIFIC.—This company is preparing plans for improvements of its ferry docks at Victoria, B. C., to cost about $150,000.

CANADIAN PACIFIC.—This company has awarded a contract to A. E. Hamilton, Moose Jaw, Saskatchewan, for a 100-ton standard mechanical coaling plant at Secretan, Saskatchewan. The company has also awarded a contract to W. A. Dutton, Winnipeg, for grading the final section of the Weyburn-Lethbridge line from Bain, Alberta, to Manyberries.

CHICAGO, BURLINGTON & QUINCY.—This company, reported in the *Railway Age* of September 30 as accepting bids for a one-story reclamation plant, 50 by 301 ft., at Eola, Ill., has awarded the contract to the Great Lakes Construction Company, Chicago. This company, reported in the *Railway Age* of September 23 as closing bids on September 25 for the construction of a passenger station, 24 by 100 ft., at Clarence, Mo., has awarded the contract to G. A. Johnson & Sons, Chicago.

CHICAGO GREAT WESTERN.—This company has awarded a contract to T. S. Leake & Company, Chicago, for the construction of a 20,000-ton capacity car icing plant 82 by 254 ft., at Oelwein, Iowa.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has awarded a contract to the International Filter Company, Chicago, for the construction of a water treating plant at Peoria, Ill., to cost approximately $25,000. The company has also awarded a contract to T. S. Leake & Company for the construction of a passenger station at Graham, Tex.

CHICAGO UNION STATION.—This company closed bids October 12 for the granite and stone work of the main building of the Union Station and for the construction of a signal tower.

ILLINOIS CENTRAL.—This company will construct a passing track of 110 cars capacity at Ramsey, Ill., at a cost of approximately $19,000. This company will also construct an additional connection with the Wabash, Chester & Western at Tamaroa, Ill., at a cost of $15.000.

ILLINOIS CENTRAL.—This company will construct a passenger and freight station at Glenwild, Miss., to cost approximately $9,000. The company will also construct extensions to its passenger station at Webster City, Iowa.

MISSOURI PACIFIC.—This company has awarded a contract to the List & Gifford Construction Company for the construction of a 2½ mile detour line between Corning, Ark., and Knobel involving the construction of 228 panels of trestle and the placing of approximately 60,000 cu. yd. of earth embankment. This company has also awarded contracts to the National Boiler Washing Company for the erection of new water treating plants at Ford, Ill., Knobel, Ark., Jefferson City, Mo., Waverly and Nevada, and for the remodeling of existing plants at Kansas City, Mo., Herington, Kan., Marquette, Concordia and Eads, Col., and Haswell, Union, Neb.

NASHVILLE & ATLANTIC.—The Interstate Commerce Commission has issued a certificate authorizing the construction of a line from Campaign, Tenn., 12 miles, in a southeasterly direction to a point on Rocky River.

NASHVILLE & ATLANTIC.—This company, which was reported in the *Railway Age* of August 19 as applying to the Interstate Commerce Commission for permission to construct an extension from Campaign, Tenn., to Rocky River, a distance of about 12 miles, has completed about four-fifths of the construction which includes a trestle 336 ft. long and 54 ft. high. The Rocky River Coal & Lumber Company, Nashville, Tenn., is the contractor.

NEW YORK, NEW HAVEN & HARTFORD.—This company has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 600-ton reinforced concrete, three-track, Rands shallow pit, automatic electric locomotive coaling plant for installation at Boston, Mass.

NEW YORK, NEW HAVEN & HARTFORD.—This company has awarded a contract to the Roberts & Schaefer Company, Chicago, for the installation of a 300-ton reinforced concrete automatic electric locomotive coaling plant at South Worcester, Mass.

NORTHERN PACIFIC.—This company has awarded a contract to the Winston-Grant Company for the construction of a 50-ft. by 153-ft. two-story brick storehouse with platforms; also the construction of a 45-ft. by 95-ft. concrete and brick boiler and engine room, including a coal trestle, at Glendive, Mont., to cost approximately $70,000.

PENNSYLVANIA.—This company is asking for bids on the work necessary to complete the east bound main track and siding, West Morrisville yard. The approximate quantities are as follows: 15,000 cu. yds. excavation; 0.6 mile unloading, piling, distributing and laying track material; 1,600 cu. yds. unloading and distributing cinder ballast, and 3 No. 8 turnouts unloaded and laid. The work will be in charge of D. P. Pugh, assistant engineer, Norristown, Pa.

STALEY SYSTEM.—W. L. Staley of Grants, N. M., as president of the Staley System of Electrical Railway, has filed an application with the Interstate Commerce Commission for a certificate authorizing the construction of a system of railway extending from a point on the boundary line between Arizona and New Mexico in Pima County, Ariz., to a point on the Colorado-Utah line in Dolores County, Colo., making a total of 950 miles with 222 miles of branches.

UNION PACIFIC.—This company, reported in the *Railway Age* of September 23 as receiving bids for the extension and repairing of its passenger station at Kearney, Neb., has awarded the contract to P. J. Sullivan, Denver, Col.

WENATCHEE SOUTHERN.—The Interstate Commerce Commission has made public a tentative report of an examiner recommending a denial of this company's application for a certificate authorizing the construction of three lines in Washington extending from Wenatchee to Beverly Junction, 53 miles; Hanford to a point near Kennewick, 29 miles, and from a point 13 miles south of Wenatchee to Orendo, 30 miles.

THE IMPERIAL JAPANESE GOVERNMENT RAILWAYS, reported in the *Railway Age* of September 16 as inquiring for 32,900 couplers for freight cars, has ordered these couplers from the National Malleable Castings Company.

THE CHILEAN STATE RAILWAYS, 141 Broadway, New York City, are asking for tenders on October 20 for spare parts for locomotives, cars and coaches to include: 22 sets of superheaters; 265 locomotive axles; 139 tender axles; 1,100 axles for freight cars and passenger coaches; 3,861 tires for locomotive, freight and passenger car wheels; 2,713 steel boiler plates of various sizes, some plain and some flanged for locomotives; 1,290 springs for freight and passenger cars; miscellaneous supplies including 782 superheater flues and accessories for locomotives, coaches and freight cars.

Photo by International

Derailment Along Delaware River, Hankins, N. Y.

Railway Financial News

BALLARD & THOMPSON.—*Application for Certificate Denied.*—The Interstate Commerce Commission has denied this company's application for a certificate for the operation in interstate commerce of a line from Thompson to Sego, Utah, 5.25 miles, heretofore operated as a plant facility.

BOSTON & MAINE.—*Asks Authority to Merge Subsidiaries.*—This company has applied to the Interstate Commerce Commission for authority to acquire by merger the property and franchises of the York Harbor & Beach, Sullivan County, Vermont Valley, Barre & Chelsea, Montpelier & Wells River, and the Portsmouth Bridge, which it has controlled for years through stock ownership. The application states that this will tend to reduce operating expenses by the elimination of accounting, fiscal and other expenses.

CANADIAN NATIONAL RAILWAYS.—*Reorganization.*—See article on another page of this issue entitled "Sir Henry Thornton to Head Canadian National."

CHESAPEAKE & OHIO.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized an issue of $12,558,500 of convertible preferred stock in temporary or definitive form to be sold at not less than par for cash, and the proceeds to be used for additions, betterments and improvements. Authority was also granted for the issue of $12,558,500 of common stock from time to time in conversion of preferred stock of the company.

CHICAGO RIVER & INDIANA.—*Equipment Notes Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $414,700 of equipment notes of the Chicago Junction. The New York Central was also authorized to guarantee the notes.

CHICAGO, ROCK ISLAND & PACIFIC.—*Authorized to Sell Bonds.*—The Interstate Commerce Commission has authorized this company to sell $2,000,000 of 4½ per cent first mortgage bonds of the St. Paul & Kansas City Short Line now held in its treasury, at not less than 83½, to reimburse its treasury for expenditures for additions and betterments to the property of the Short Line company.

CHICAGO, ROCK ISLAND & PACIFIC.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $5,000,000 of first and refunding mortgage 4 per cent gold bonds to be sold at not less than 85, the proceeds to be used for additions and betterments, instalments of equipment trust notes and to pay indebtedness of the applicant to the War Finance Corporation.

CRYSTAL RIVER & SAN JUAN.—*Authorized to Operate Railroad.*—The Interstate Commerce Commission has issued a certificate authorizing this company to operate its railroad extending from a connection with the Denver & Rio Grande Western at Carbondale, Colo., in a general southerly direction to Placita, Colo., 20.66 miles, and also the railroad of the Crystal River Railroad Company extending from Placita to Marble, 7.32 miles. The former railroad was built by an industrial company for the transportation of quarried marble and the latter is controlled by the Colorado Fuel & Iron Company.

DAYTON, TOLEDO & CHICAGO.—*Asks Authority to Abandon Line.*—The receiver has applied to the Interstate Commerce Commission for authority to abandon its line from Delphos to Stillwater Junction, Ohio, 90 miles.

DENVER & RIO GRANDE.—*Sutro Committee Re-opens Contest.*—A committee, of which Richard Sutro is chairman, and the other members are Lewis L. Clarke, president of the American Exchange National Bank, and William Loeb, Jr., has asked holders of the Denver & Rio Grande first and refunding mortgage five per cent bonds and the seven per cent cumulative adjustment mortgage bonds to deposit their securities with the American Exchange National Bank, the depository of the Sutro committee. In its statement to the security holders the Sutro committee says:

> An exigency has arisen affecting the security of your investment and requiring prompt and aggressive action for its protection. This has prompted the undersigned committee to urge you to deposit with it such of your refunding bonds as have not yet been deposited with any of the committees, and to withdraw from the Hammond committee (which is charged to be acting for or under the domination of the Western Pacific Corporation) and from the Perkins committee (which is charged with being a Missouri Pacific committee), as well as from the Equitable Trust Company, which is admittedly acting in the interest of the Western Pacific Corporation, by depositing with the undersigned committee all certificates of deposit in respect of such bonds as are held by you.

The Sutro committee has made public a long letter from its counsel, Samuel Untermyer, narrating his application to the Federal Court in Denver for an order to the receiver to default interest payment on Rio Grande Western consolidated 4 per cent bonds. Mr. Untermyer points out that such default is the only method by which holders of the Denver refunding and adjustment bonds may recover an equity to which they are entitled in the stock of the Utah Fuel Company, which is pledged under the Rio Grande Western consolidated 4s. He advises that the refunding mortgage bondholders should insist to the court that default be made in interest on the Rio Grande Western bonds as a means of forcing the trustee of that mortgage into court, that they appeal in event of an adverse ruling and that they apply to the Interstate Commerce Commission for an open investigation of the history of the Denver & Rio Grande and the Western Pacific and their relations with the Missouri Pacific.

DETROIT, BAY CITY & WESTERN.—*Receivership.*—H. L. Stanton, vice-president of the Detroit Trust Company, has been appointed receiver of this road by the United States District Court for the eastern district of Michigan. The Detroit, Bay City & Western operates between Bay City, Mich., and Marine City, 120 miles.

ILLINOIS CENTRAL.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $6,645,000 of equipment trust certificates to be issued by the Commercial Trust Company of Philadelphia and sold at not less than 95.

INTERNATIONAL & GREAT NORTHERN.—*Reorganization—New Officers.*—According to J. & W. Seligman & Co. and Speyer & Co., reorganization managers, J. W. Kendrick and T. A. Hamilton, now vice-president of the St. Louis-San Francisco, will be president and general manager of the newly reorganized International & Great Northern. The details in connection with the reorganization are progressing to the satisfaction of the reorganization managers and it is expected that the reorganization will be completed and the new securities ready for delivery before the end of the present year.

MISSISSIPPI & ALABAMA.—*Authorized to Operate Line.*—The Interstate Commerce Commission has issued a certificate authorizing this company to operate under lease 17 miles of railroad from Vinegar Bend, Ala., to Leakesville, Miss., a part of the line formerly operated by the Alabama & Mississippi which the commission had permitted that company to abandon.

MORGANTOWN & WHEELING RAILROAD.—*Asks Certificate for Acquisition and Operation.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing the acquisition and operation of the property of the Morgantown & Wheeling Railway between Blacksville and Morgantown, W. Va., 25 miles, and that of the Monongahela & Ohio, 3½ miles, in connection with its own line of 14 miles from Waynesburg, Pa., to Blacksville, which will make a through line from Morgantown to Waynesburg, Pa.

OREGON TRUNK.—*Authorized to Abandon Deschutes Canyon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of this company's line from South Junction to Metolius, Ore., 28.92 miles, part of its main line up the Deschutes Canyon, which for the greater part of its distance is paralleled by the Central Oregon branch of the Oregon-Washington Railroad & Navigation Company. The two lines were built by the Hill and Harriman interests at a time of keen competition after which an agreement was made for partial joint construction and operation and but one line was built from

(*Continued on Page 729*)

Annual Report

Twenty-Eighth Annual Report of Southern Railway Company—Year Ended Dec. 31, 1921.

RICHMOND, Va., October 10, 1922.

To the Stockholders of

SOUTHERN RAILWAY COMPANY:

The Board of Directors submits the following report of the affairs of the Company:

The income account for the year ended December 31, 1921, which was published in March last and showed a balance of $2,026,622 over fixed charges is here reproduced as the first of the accompanying tables of financial data and statistics. It should be stated, as will be obvious on a comparative study, that some of the non-operating income figures include items, made available through settlements between the Federal Government and affiliated companies, which are not normally income on capital operations during that year.

This report will be devoted to a discussion of matters of current interest.

OPERATIONS.

The financial results from operation for the first half of the current year present a gratifying comparison with the year 1921. During the six months from January first to June 30, 1922, the operating income remaining after the payment of expenses, taxes, hire of equipment and joint facility rents amounted to $8,877,425, an increase of $6,733,478 over the $2,143,947 of operating income for the first six months of the preceding year. The gross was approximately the same, being $421,331, or little more than one-half of one per cent., less in 1922 than in 1921. The revenue from freight traffic was $2,336,813, or 5.68%, larger in 1922, but there was a falling off of about the same amount in revenue from the operation of passenger trains. Notwithstanding the fact that approximately the same passenger train service had to be maintained for a substantially smaller volume of traffic, operating expenses in the first six months of 1922 were reduced $7,538,785, or 13.51%, below the level for the same period of 1921, and of this reduction more than five millions were saved in conducting transportation, less than one-half of that amount being cut from the maintenance appropriations. The operating and transportation ratios in the first six months of 1922 were 77.87 and 39.39, respectively, compared with 89.43 and 47.14 in the preceding year. A surplus of $2,003,737 of income remaining after the payment of fixed charges for the first six months of 1922, compared with a deficit of $4,757,515 for the same period of 1921, an improvement of no less than $6,761,252.

These results augured well for a prosperous year, but the realization has been deferred by the consequences of what must now be recognized to have been a futile, if well intentioned, effort by governmental regulating bodies to reduce the cost to the public of freight transportation. First the Interstate Commerce Commission directed that effective July 1, 1922, freight rates should be lowered ten per cent. below the level which obtained on August 26, 1920. Then the Railroad Labor Law decided that wages of certain employees should be reduced from the same date. A nation wide strike of members of the several organizations of railroad shop crafts followed the application of that decision. The strike was a failure and is now history, but it may well have had the economic effect of postponing indefinitely any further diminution of freight rates. Uncertainty will continue to obscure hope in these respects so long as one governmental agency fixes income and another fixes outgo without economic relation the one to the other. If governmental agencies are to continue to determine the destiny of the railroads in these vital respects, there must be such coordination between those agencies as will relate their policies and at the same time establish their power to carry the whole purpose into effect. The time seems to have come for a single responsible regulating commission.

Despite these handicaps for lower freight rates and disorganization of labor, the results for the full year 1922 should be satisfactory, given during the remainder of the year the volume of traffic which now appears reasonably assured.

INDUSTRIAL AND AGRICULTURAL DEVELOPMENT IN THE TERRITORY SERVED.

Business in the South is again on the upgrade.

The output of the mills and factories has been steadily increasing during the last few months.

An outstanding feature has been the operations of the cotton mills, a happy contrast with the strike-ridden cotton manufacturing centers of the East. In July, 1922, according to figures compiled by the United States Census Bureau, 96.97 per cent. of the spindles in mills in the cotton producing states were active, while in other states the percentage of active spindles was only 78.53. During that month the average active spindle hours in the South was 250 compared with 145 in other states. In the twelve months ended July 31, 1922, the mills in the cotton producing states consumed 3,733,147 bales, which compares with a consumption of 2,178,767 bales by mills in the other states. The more favorable conditions for the cotton manufacturing industry in the South are reflected not only in operating statistics, but also in the record of new mill construction. During the same twelve months, according to the Census Bureau reports, there was a net increase of 245,831 spindles in Southern mills, and a net increase of only 79,627 spindles in mills in states outside of the South. A survey of new mills under construction or in prospect, indicates a continuation of the tendency shown by these figures.

There has been unusual activity in the provision of new business and residential structures, as well as in the construction of improved highways.

The mineral exhibit by Southern Railway System at the National Exposition of Chemical Industries held annually in New York City, has been productive of good results. It has afforded a convenient opportunity for those looking for new supplies of raw materials actually to see specimens of the materials available in the South, and to learn the location, character and extent of the deposits. The latest exhibit in September, 1922, called forth a large number of interested inquiries which should result in the establishment of new enterprises, as well as the enlargement of existing operations, with resultant increases in the Company's traffic.

While the farmers of the South have not recovered from the fall in the prices of staple farm products which occurred in 1920, a large part of the indebtedness which they were compelled to incur in 1920 and 1921 has been discharged, thanks to the practice of economy and the diversification of farm operations.

The Southern farmer is making hopeful progress in his journey from dependence upon a single money crop, with its one pay-day per year at market time for cotton or tobacco, toward the independence to be obtained by the operation of his farm to yield cash returns throughout the year from the sale of truck crops, cattle, hogs, poultry and dairy products. One proof of this progress is found in a report by the United States Bureau of Markets that from January 1, 1922, to August 19, 1922, there were shipped from the states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Tennessee, 107,298 carloads of cabbage, canteloupes, lettuce, onions, strawberries, sweet potatoes, tomatoes, water-

Table 1.—INCOME STATEMENT.

	1921.	1920.
Operating Revenues:		
Freight	$85,185,081.64	
Passenger	32,104,922.09	
Miscellaneous Passenger-Train	977,457.21	
Mail	3,373,069.76	
Express	2,649,455.14	
Other Transportation	1,258,256.26	
Incidental	2,292,062.57	
Joint Facility	874,845.34	
Total Operating Revenues	$128,715,150.01	
Operating Expenses:		
Maintenance of Way and Structures	$19,287,487.46	
Maintenance of Equipment	23,396,099.60	
Traffic	2,556,857.51	
Transportation	55,443,873.12	
Miscellaneous Operations	1,055,085.09	
General	4,096,996.90	
Transportation for Investment—Credit	7,392.72	
Total Operating Expenses	$105,829,006.96	
Net Revenue from Operations	$22,886,143.05	
Taxes	$4,582,292.92	
Uncollectible Revenues	85,042.89	
Hire of Equipment	3,407,707.62	
Joint Facility Rents	839,317.71	
Total Other Expenses	$8,914,361.14	
Operating Income	$13,971,781.91	$15,320,073.35
Non-Operating Income:		
Income from Lease of Road	$207,279.84	$32,405.98
Miscellaneous Rent Income	263,558.35	248,308.57
Income from Rail Leased	99,902.36	82,629.78
Dividend Income	2,112,894.73	1,268,692.48
Income from Funded Securities	888,535.41	904,361.02
Income from Unfunded Securities and Accounts	652,568.93	286,597.66
Miscellaneous Income	14,453.80	27,542.79
Total Non-Operating Income	$4,239,193.42	$2,850,538.28
Total Gross Income	$18,210,975.33	$18,170,611.63
Deductions from Total Gross Income:		
Rent for Leased Roads	$2,586,420.94	$2,827,173.41
Miscellaneous Rents	11,322.03	45,058.29
Separately Operated Properties	574,687.34	548,734.18
Interest on Unfunded Debt	663,725.49	492,405.61
Miscellaneous Income Charges	145,638.70	123,387.99
Total Deductions of this Class	$3,981,794.50	$4,036,758.48
Total Available Income	$14,229,180.83	$14,133,853.15
Interest on Funded Debt	$11,061,795.31	$11,144,830.00
Interest on Equipment Obligations	914,754.75	1,046,866.26
Dividend on Southern Railway—Mobile and Ohio Stock Trust Certificates	226,008.00	226,008.00
Total Deductions of this Class	$12,202,558.06	$12,417,704.26
Balance of Income Over Charges	$2,026,622.77	$1,716,148.89
Dividend of 2½% on Preferred Stock Paid December 31, 1920	.....	1,500,000.00
Additions and Betterments Charged to Income	.....	88,094.20
Miscellaneous Appropriations of Income	7,252.37	14,340.81
Balance Carried to Credit of Profit and Loss	$2,019,370.40	$113,713.88

Operating Revenues and Expenses are not comparable, the property having been operated by the United States Railroad Administration during January and February, 1920.

Table 2.—PROFIT AND LOSS.

Credit Balance December 31, 1920		$46,974,374.24
Add:		
Credit Balance of Income for the Year	$2,019,370.40	
Credit Resulting from Settlement of Claim Against United States Government	17,949,785.34	
		19,969,155.74
		$66,943,529.98
Deduct:		
Property Retired	$3,302,331.54	
Securities Written Down	4,577,196.00	
Accounts Written off	1,610,383.94	
Discounts on Securities	1,190,749.41	
Net Miscellaneous Debits	822,073.66	
		11,502,734.55
Credit Balance December 31, 1921		$55,440,795.43

melons, Irish potatoes, peaches and mixed vegetables, compared with 83,629 carloads for the same period of last year, an increase of 23,669 carloads, or 28.30 per cent., and this showing was made in spite of the fact that there was a substantial decrease in production of watermelons and peaches because of unfavorable weather conditions. Other bits of evidence of the same character are the establishment of twenty-six new creameries in the territory served by Southern Railway System, a large increase in the production of butter, the raising in south Georgia of milk fed poultry along the lines for many years profitably practiced in east Tennessee, the placing on farms throughout the territory of more pure bred poultry than in any previous year, and the growing of high grade tobacco in South Carolina and Georgia.

The higher price for cotton accompanying last year's small crop, led to larger plantings this year throughout the entire cotton belt. Adverse weather conditions and boll weevil ravages have cut down the yield in some localities, but latest condition reports appear to indicate that this year's crop will be larger than last. Production costs have been relatively low, and the crop should be sold at profitable prices.

The movement of farm settlers into the South, comparatively light for several years past, shows signs of increasing. Sound and conservative colonization projects are being launched in several localities served by Southern Railway System. Lands will be prepared for farming and offered on terms which should attract a desirable class of farmers from parts of the United States where land prices, measured by productive value, relatively are much higher than in the South.

It is fair to say that the farmers of the South now are in a more cheerful state of mind than they have been at any time for the past two years.

IMPROVEMENTS AND BETTERMENTS IN THE CAPITAL ACCOUNT.

No additions of importance were made to the property during the year 1921, but in May last arrangements were made to acquire 6,445 box cars, 100 passenger-train cars and 250 caboose cars. The cost of this equipment is $11,736,000, and the money was provided partly from current treasury funds, and the remainder from the sale of $9,300,000 Series "W" 5½% equipment trust certificates dated May 15, 1922, payable in thirty equal semi-annual installments. The substantial addition to the freight car supply thus provided should go far toward remedying the hire of equipment balances against the Company which have been conspicuous in recent income statements.

A start has been made in relaying with 100-lb. rail the existing 85-lb. rail in the heavy traffic main lines.

FINANCING CAPITAL REQUIREMENTS.

Confronted with the necessity of enlarging its facilities to handle a growing traffic, and unable to obtain a satisfactory price for four per cent. bonds secured by the Development and General Mortgage, the Company has for many years past been forced to resort to short term note issues to provide money for essential additions and improvements. The latest issue of $25,000,000 of such notes, made in 1919, to refund a previous issue, matured on March 1, 1922, and presented again the constantly recurring financial problem. A solution was found in the sale of thirty million dollars of bonds issued under the Development and General Mortgage carrying coupons calling for the payment of interest at the rate of six and one-half per cent. per annum. While only four per cent. of this annual interest rate could be secured by the mortgage, because of an express limitation in that respect, the remaining two and one-half per cent. interest is represented by the Company's unconditional promise to pay and is further protected by a covenant to secure such payment in any new mortgage which hereafter may be placed upon the railways subject to the Development and General Mortgage. An immediate and wide distribution of these new bonds was convincing evidence of hearty approval of the issue by the investment community. From the proceeds of this financing the short term notes were paid off, as also was a loan owed to the War Finance Corporation.

RELATIONS WITH EMPLOYEES.

To all officers and employees who have faithfully and efficiently performed their duties, the thanks of the Board of Directors again are tendered. Especially does the Board desire to record its appreciation and admiration of the service rendered by those loyal and courageous officers and employees who operated the railroad during the strike.

The Directors, with deep regret, record the death on August 11, 1922, of their esteemed associate Bishop John Carlisle Kilgo.

Respectfully submitted, by order of the Board,

FAIRFAX HARRISON,
President.

Table 3.—GENERAL BALANCE SHEET.

ASSETS	December 31, 1921.	December 31, 1920.
Investments:		
Investment in Road	$349,621,233.47	$352,256,487.95
Investment in Equipment	90,183,524.90	89,344,507.44
Total Investment in Road and Equipment	$439,804,758.37	$441,600,995.39
Cash Deposited in Lieu of Mortgaged Property Sold	$6.800.00	$9,822.50
Miscellaneous Physical Property	989,206.59	918,982.98
Investments in Affiliated Companies:		
Stocks	$35,224,658.76	$35,329,105.90
Bonds	26,307,912.28	28,307,968.38
Notes	4,535,655.53	4,936,368.04
Advances	3,873,143.96	4,222,017.69
Total Investments in Affiliated Companies	$69,941,370.53	$72,795,460.01
Other Investments:		
Stocks	$94,008.00	$94,007.00
Bonds	2,658,913.45	5,158,913.45
Notes	421,460.24	418,680.17
Total Other Investments	$3,174,381.69	$5,671,600.62
Total Investments	$513,916,517.18	$520,996,861.50
Current Assets:		
Cash	$8,097,605.58	$7,969,141.67
Special Deposits	8,475,700.50	3,062,487.10
Loans and Bills Receivable	867,662.92	532,810.19
Traffic and Car Service Balances Receivable	2,720,022.19	2,522,554.16
Balances due from Agents and Conductors	312,615.45	1,250,792.01
Miscellaneous Accounts Receivable	7,006,758.98	11,023,190.39
Material and Supplies	13,473,154.76	17,635,896.18
Interest and Dividends Receivable	1,277,280.99	768,220.39
Other Current Assets	540,526.22	1,788,645.36
Total Current Assets	$42,771,327.59	$46,553,737.45
Deferred Assets:		
Working Fund Advances	$48,836.78	$40,547.06
Cash and Securities in Insurance Fund	1,246,037.33	1,252,975.32
Cash Deposited under North Carolina Railroad Lease	175,000.00	175,000.00
Other Deferred Assets	86,383.33	442,910.46
Total Deferred Assets	$1,556,257.44	$1,911,432.84
Unadjusted Debits:		
Insurance Premiums and Rents paid in Advance	$18,228.58	$67,189.23
Additions and Betterments Expenditures: Freight Claims; Foreign Mileage and Sundry Items in Suspense	3,329,108.22	4,755,661.91
Total Unadjusted Debits	$3,347,336.80	$4,822,851.14
Claim Against United States Government	.....	$35,142,487.60
Securities of the Company held by it:	1921 / 1920	
Unpledged	$25,569,200.00 / $7,452,200.00	
Pledged	48,014,000.00 / 58,495,000.00	
Totals	$73,583,200.00 / $65,947,200.00	
Grand Totals	$561,591,439.01	$609,427,370.53

LIABILITIES	December 31, 1921	December 31, 1920
Capital Stock:		
Common	$120,000,000.00	$120,000,000.00
Preferred	60,000,000.00	60,000,000.00
Total Southern Railway Company Stock	$180,000,000.00	$180,000,000.00
Southern Ry.-Mobile & Ohio Stock Trust Certificates	$5,650,200.00	$5,650,200.00
Long Term Debt (Table 4)	$237,318,500.00	$234,212,500.00
Equipment Trust Obligations (Table 5)	15,773,800.00	18,721,000.00
Total Long Term Debt	$253,092,300.00	$252,933,500.00
Total Capital Liabilities	$438,742,500.00	$438,583,700.00
Governmental Grants:		
Grants since July 1, 1914, in aid of Construction	$84,078.58	$84,078.58
Current Liabilities:		
Loans and Bills Payable	$5,954,270.00	$7,880,270.00
Traffic and Car Service Balances Payable	2,023,634.11	3,963,909.37
Audited Accounts and Wages Payable	14,592,011.25	21,126,810.15
Miscellaneous Accounts Payable	2,399,027.75	2,975,592.00
Interest Matured, including interest due January 1st	2,925,320.70	2,898,169.30
Dividends Matured Unpaid	820.00	2,200.00
Funded Debt Matured Unpaid	32,589.80	161,727.80
Unmatured Dividends Accrued	56,502.00	56,502.00
Unmatured Interest Accrued	1,824,735.32	1,930,730.60
Unmatured Rents Accrued	320,804.96	356,108.55
Expenses Accrued not vouchered	1,490,511.86	1,420,563.03
Other Current Liabilities	1,089,735.58	1,854,530.99
Total Current Liabilities	$32,709,963.33	$44,627,113.79
Deferred Liabilities:		
Sundry Deferred Liabilities	$1,291,545.53	$1,624,081.29
Unadjusted Credits:		
Taxes	$1,251,395.94	$675,180.43
Insurance Reserve	1,246,037.33	1,252,975.32
Operating Reserves	1,304,255.11	2,762,394.84
Depreciation accrued on:		
Rail Leased to Other Companies	131,268.41	139,899.47
Equipment Owned	24,674,114.84	22,508,413.47
Equipment Leased from Other Companies	630,662.48	563,122.71
Sundry Items	2,308,488.66	3,985,425.90
Total Unadjusted Credits	$31,546,222.77	$31,887,412.14
Corporate Surplus:		
Additions to Property, since June 30, 1907, through Income and Surplus	$1,754,740.19	$1,661,187.48
Miscellaneous	21,593.18	14,340.81
Total Appropriated Surplus	$1,776,333.37	$1,675,528.29
Profit and Loss—Balance	$55,440,795.43	$46,974,374.24
Unadjusted Items (Net) Subject to Settlement of Claim with United States Government	.....	$43,971,082.20
Grand Totals	$561,591,439.01	$609,427,370.53

[ADVERTISEMENT]

(*Continued from page 726*)

Metolius to Bend. The companies have now agreed upon the joint use of the line of the Oregon-Washington between South Junction and Metolius and the Oregon Trunk desires to remove its tracks.

PENNSYLVANIA.—*Authorized to Lease Subsidiaries.*—The Interstate Commerce Commission has issued a certificate authorizing the acquisition by lease for 999 years of the Wheeling Terminal; Englewood Connecting; South Chicago & Southern; Toledo, Columbus & Ohio River; Cleveland, Akron & Cincinnati; Cincinnati, Lebanon & Northern; Pittsburgh, Ohio Valley & Cincinnati; Ohio Connecting; Indianapolis & Frankfort, and the Louisville Bridge & Terminal.

SABINE & NECHES VALLEY.—*Acquisition of Line Authorized.*—The Interstate Commerce Commission has issued a certificate authorizing this company to acquire and operate 11½ miles of railroad from Deweyville to Gist, Texas, and to issue $100,000 of stock, $82,000 of which, together with $24,000 of promissory notes, are to be used in payment for the railroad.

SOUTHERN PACIFIC.—*Petition for Rehearing of Dissolution Case Denied.*—The United States Supreme Court on October 9 denied this company's petition for a rehearing of the case in which the court ordered a separation of the Central Pacific from the Southern Pacific.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—The stockholders on October 9 voted to increase the capital stock from $50,000,000 to $100,000,000. President Henry Miller said:

The Terminal Railroad Association of St. Louis has outgrown the original financial structure of $50,000,000 made in 1902. At that time it could not be foreseen that the rail tonnage of this region would treble in 20 years. In the light of this experience, the plan and scope must be broadened. It is of vital importance to this community and the railroads that transportation facilities be provided through which traffic may flow freely in increasing volume, and every impediment should be removed as early as possible. Hence, the stockholders and directors at today's meeting voted to increase the authorized capital stock and bonded indebtedness from $50,000,000 to $100,000,000, to provide the financial means for improvements and future growth of the properties and to meet maturing obligations.

VIRGINIAN.—*Ford Not Seeking Road.*—President Clarence W. Huntington denies reports that Henry Ford has attempted to buy the Virginian or that any change in control or management of the road may be expected.

According to dispatches from Norfolk, Ford has long sought a deep-water terminal for a steamship line which could handle his automobile export business.

WESTERN PACIFIC.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $5,500,000 of first mortgage 6 per cent bonds, the proceeds to be applied to the acquisition of 2,000 refrigerator cars and 100 automobile cars. It is proposed to sell the bonds at 94.

Dividends Declared

Morris & Essex Extension.—2 per cent, payable November 1 to holders of record October 24.

Passaic & Delaware Extension.—2 per cent, payable November 1 to holders of record October 24.

Pere Marquette.—Preferred, 1¼ per cent, quarterly; preferred (account accumulated dividends) 1 per cent; prior preferred, 1¼ per cent, quarterly; all payable November 1 to holders of record October 14.

Syracuse, Binghamton & New York.—3 per cent, quarterly, payable November 1 to holders of record October 24.

Utica, Chenango & Susquehanna.—3 per cent, payable November 1 to holders of record October 14.

Trend of Railway Stock and Bond Prices

	Oct. 10	Last Week	Last Year
Average price of 20 representative railway stocks	72.35	72.58	56.48
Average price of 20 representative railway bonds	88.65	88.70	76.99

THE CHICAGO UNION STATION, reported in the *Railway Age* of August 12 as inquiring for 8 tractors and 200 trailers for use in the mail building, has ordered 6 tractors and the 200 trailers from the Mercury Manufacturing Company, Chicago, and 2 tractors from the Elwell-Parker Electric Company, Cleveland, Ohio.

Railway Officers

Executive

W. R. McGraw, superintendent of the St. Louis Southwestern, with headquarters at Pine Bluff, Ark., has been elected vice-president of the St. Louis Southwestern of Texas, and appointed general superintendent of the St. Louis Southwestern lines, with headquarters at Tyler, Tex.

Financial, Legal and Accounting

Clarence R. Smith has been appointed auditor of the Cambria & Indiana with headquarters at Philadelphia, Pa., effective September 20.

Operating

H. H. Hooper has been appointed superintendent of the Cambria & Indiana with headquarters at Colver, Pa., effective September 20.

H. C. Brock has been appointed trainmaster of the Plains division of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex.

M. O. Willard, supervisor of wages of the Oregon Short Lines, has been appointed assistant to the general manager, with headquarters at Salt Lake City, Utah.

J. P. Johnson, assistant superintendent of the Canadian National, with headquarters at Prince Albert, Sask., has been promoted to superintendent of the Prince Albert division, with the same headquarters.

D. W. Bowker, assistant superintendent of the St. Louis Southwestern, with headquarters at Illmo, Mo., has been promoted to superintendent, with headquarters at Pine Bluff, Ark., succeeding W. R. McGraw, promoted, and will be succeeded by **H. A. Dickey**.

A. C. McDamnell, general superintendent, purchasing agent and traffic manager of the Detroit, Bay City & Western, with headquarters at Bay City, Mich., has been appointed general manager, acting for the Detroit Trust Company, which has been appointed receiver of this road.

J. W. Riley has been appointed district manager of the Car Service Division with headquarters at St. Louis, Mo. He will have the authority of the Car Service Division in the territory which includes terminals at St. Louis, Kansas City, St. Joseph, Omaha, Council Bluffs, and other outlying points as may be directed.

Traffic

M. R. Scanlon has been appointed general agent of the Green Bay & Western, the Kewaunee, Green Bay & Western and the Ahnapee & Western, with headquarters at Toledo, Ohio.

Mechanical

O. M. Foster has been appointed district superintendent of motive power of the New York Central with headquarters at Collinwood, Ohio. **W. R. Lye** has been appointed district superintendent of motive power with headquarters at Elkhart, Ind.

H. Jefferson has been appointed road foreman of engines of the Second and Third Districts of the Plains division of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Texas. **W. C. Sherman** has been appointed road foreman of engines of the First, Shattuck and Buffalo districts, including the Canadian terminal of the Plains division, with headquarters at Canadian, Texas.

Engineering, Maintenance of Way and Signaling

J. H. Baker, whose promotion to assistant engineer of valuation of the Southern Pacific, with headquarters at Los Angeles, Cal., was reported in the *Railway Age* of August 26 (page 403), was born April 30, 1882, at New York. He entered railway service in April, 1905, as a chainman on the Los Angeles & Salt Lake and until November, 1905, was successively rodman and levelman. From November, 1905, to November, 1907, he was engaged in subdivision work at Los Angeles and levelman and transitman on location surveys. In February, 1907, he entered the service of the Western Pacific as a transitman and from February, 1908, to December, 1908, he was in charge of engineering work at Townsite Bay Point, Cal. In January, 1909, he entered the employ of the Southern Pacific of Mexico as an instrumentman and remained with this road until March, 1910, when he was made engineer in charge of an irrigation project, which position he held until November, 1910 when he entered the valuation department of the Southern Pacific in which work he has been engaged until his recent promotion.

H. A. Cassil, whose promotion to chief engineer of the Pere Marquette, with headquarters at Detroit, Mich., was reported in the *Railway Age* of September 30, was born at Mt. Vernon, O. He entered railway service on January 1, 1898, with the Cleveland, Akron & Columbia (Pennsylvania). He entered the employ of the Pere Marquette in 1901 where he held several positions including that of division engineer of the Detroit-Canadian division. He left this road in 1906 to become associated with the Canadian White Construction Company of Montreal, Que. Two years later he reentered railway service in the maintenance of way department of the Cincinnati, Hamilton & Dayton, where he remained until this company was absorbed by the Baltimore & Ohio. He was then in the service of the Baltimore & Ohio Southwestern and the Baltimore & Ohio in various capacities until the reorganization of the Pere Marquette in 1917, at which time he was appointed engineer maintenance of way, which position he has held until his recent promotion to chief engineer.

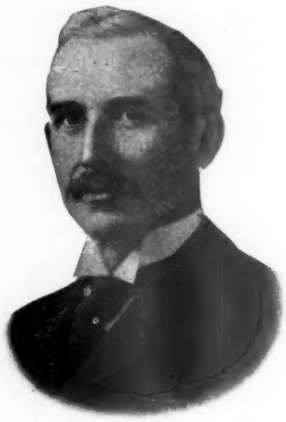
H. A. Cassil

A. J. Hammond, assistant chief engineer of the Chicago Union Station Company, whose resignation on September 30, to become associated with James O. Heyworth, engineer and contractor, Chicago, was reported in the *Railway Age* of October 7 (page 680), is a graduate of Rose Polytechnic Institute and a post graduate of Massachusetts Institute of Technology. He was engaged in municipal engineering work in Indiana up to 1898, on which date he entered railway service as an assistant engineer on the Vandalia (Pennsylvania), with headquarters at Terre Haute, Ind., in which capacity he remained until 1901, when he engaged in private practice, at the same time being city engineer of South Bend, Ind. From 1909 to 1910, he was consecutively chief engineer of the Southern Michigan and Northern Indiana Electric Railways; bridge engineer of St. Joseph county, Ind., and consulting engineer of hydro-electric plants at South Bend and Elkhart, Ind., and Paw Paw, Mich. In 1910, he was appointed consulting engineer of the city of Chicago for the intake water tunnel at Seventy-third street and in 1911, chief engineer of the Bureau of Public Efficiency of Chicago. From 1912 to 1913, he was engineer of bridges and harbors of the same city during which time he designed the Michigan Boulevard, the Lake street, the Chicago avenue, the Belmont avenue bridges, and a number of fixed bridges. In 1914, he became consulting engineer of the Chicago Union Station Company and in 1915 was promoted to assistant chief engineer in charge of the design and construction of the passenger terminal, which position he held until his resignation on September 30.

Obituary

H. Hall, president and general manager of the New Orleans & Lower Coast, with headquarters at New Orleans, La., died on September 28 from septicemia.

Frank Owen Waldo, retired auditor of the Michigan Central, died in Detroit on October 4. Mr. Waldo was born in Hammond, New York, on December 11, 1854. He entered the service of the Rome, Watertown & Ogdensburg (now New York Central) as a telegraph operator at DeKalb Junction, N. Y., in 1870. He continued in various capacities with that road until August 12, 1876, when he entered the service of the Michigan Central as a clerk in the Auditor's office. He served with that company successively as general bookkeeper and chief clerk and on April 1, 1887, was appointed ticket accountant. He was promoted to assistant auditor on November 1, 1892, and was appointed auditor on October 8, 1908. Mr. Waldo retired from active service on account of ill health on June 1, 1918.



F. O. Waldo

Cecil A. Preston, valuation engineer of the Pennsylvania, died at Philadelphia on October 9. Mr. Preston was born in Philadelphia 70 years ago and was graduated from the Polytechnic College of Philadelphia in 1872 as a civil engineer. He at once entered railroad construction work, but he did not enter the service of the Pennsylvania until 1879. His first service with this company was in connection with surveys for new lines. On March 1, 1880, he was appointed assistant supervisor of the Baltimore section of the Northern Central; but after a few months he resigned and went to Mexico where he was engaged as principal assistant engineer of the Mexican National Construction Company, but returned to the Pennsylvania (Northern Central) in 1882 as assistant supervisor at York, Pa. He then served in various engineering positions until July, 1900, when he was appointed superintendent of the Elmira and Canandaigua divisions of the Northern Central with headquarters at Elmira, New York. In 1902 he was transferred in a similar capacity to Williamsport, and in the following year was appointed superintendent of the Middle division of the Pennsylvania at Altoona. In 1913 he was appointed valuation engineer, in which capacity he was serving at the time of his death.

C. A. Preston